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PART III—SECTION 3

Notifications relating to Minor Administration

THE LACCADIVE, MINICOY AND AMINDIVI ISLANDS WEIGHTS AND MEASURES (ENFORCEMENT) RULES, 1963

INDEX TO THE RULES

| Rule No. | Subject | Page |
|----------|---|------|
| 1 | Short title | 13 |
| 2 | Definitions | 13 |
| 3 | Reference standards | 13 |
| 4 | Secondary standards | 13 |
| 5 | Working standards | 13 |
| 6 | Reference standard balances | 13 |
| 7 | Secondary standards balances | 14 |
| 8 | Working standard balances | 14 |
| 9 | Commercial weights and measures | 14 |
| 10 | Weighing and measuring instruments | 14 |
| 11 | Display of conversion tables | 14 |
| 12 | Stamping of bullion weights | 14 |
| 13 | Visit and other duties of Inspector | 14 |
| 14 | Sealed packages containers, etc. | 14 |
| 15 | Stamping of weights, etc. | 14 |
| 16 | Transitional provisions | 14 |
| 17 | Procedure for carrying out inspections, etc. | 14 |
| 18 | Monthly report of the inspector | 14 |
| 19 | Obliteration of stamps | 15 |
| 20 | Verifications under Rule 19 after adjustment | 15 |
| 21 | Exemption from levy of fees | 15 |
| 22 | Seizure, detention and disposal of un-authorised weights measures and instruments | 15 |
| 23 | Qualifications of Inspectors | 15 |
| 24 | Duties of Inspectors | 15 |
| 25 | Inspectors to be provided with working standards balances, etc. | 15 |
| 26 | Licensing of manufacturers repairs and dealers of weights, measures, etc. | 15 |
| 27 | Records to be maintained by manufactures, etc. | 15 |
| 28 | Certificate of verification to be exhibited | 15 |
| 29 | | |
| 30 | | |
| 31 | Penalty | 15 |

Short title

1. These rules may be called the Laccadive, Minicoy and Amindivi Islands Weights and Measures (Enforcement) Rules, 1963.

Definitions

2. In these rules, unless the context otherwise requires:—

- (a) Regulation means the Laccadive, Minicoy and Amindivi Islands Weights and Measures (Enforcement) Regulation 1963.
- (b) 'Schedule' means a schedule appended to these rules;
- (c) 'Secondary standards' means the set of standard weights and measures referred to in section 4 of the Regulation.
- (d) 'working standards' means the set of standard weights and measures referred to in section 3 of the Regulation;
- (e) all words and expressions used but not defined in these rules and defined in the Regulation shall have the meanings respectively assigned to them in the Regulation (No. 5 of 1961).

Reference standards

3. The reference standards shall be kept in the custody of the controller

Secondary standards

4. (1) The secondary standards shall conform as regards denominations, material used in construction and design, to the specifications laid down in Schedule I.

(2) The secondary standards shall be kept at such places, in such manner and in such custody as the Controller may direct.

(3) A secondary standard shall be verified with the reference standard at least once in every period of five years, adjusted, if necessary, and marked with the date of verification, by the controller.

(4) The limits of error which may be tolerated in the secondary standards on verification or re-verification after adjustment shall be as specified in Schedule I.

Working standards

5. (1) The working standards shall conform as regards denominations, material used in construction and design to the specifications laid down in schedule II.

(2) The working standards shall be prepared at such place and authenticated by such person or authority as may be specified by the Administrator, Laccadive, Minicoy and Amindivi Islands.

(3) The working standards shall be kept in the custody of the Inspectors.

(4) A working standard shall be verified with the secondary standard at least once in every twelve months, adjusted, if necessary, and stamped with the date of verification by the Controller or such other person as may be authorised by him in this behalf.

(5) The limits of error which may be tolerated in the working standards on verification or re-verification after adjustment shall be as specified in Schedule II.

Reference standard balances

6. (1) The Controller shall maintain a set of reference standard balances at the place where the reference standards are kept.

(2) The number, types and specifications of Reference standard balances shall be as laid down in schedule III.

(3) The Controller shall verify reference standard balances at least once in every twelve months, adjust them, if necessary to make them correct within the limits of sensitiveness, certify and stamp them, if practicable, with the date of verification.

Secondary standard balances

7. (1) A set of secondary standard balances shall be maintained at every place where the secondary standards are kept.

(2) The number, types and specifications of such balances shall be as laid down in schedule III.

(3) The Controller shall cause to be verified such balances at least once in every twelve months and shall cause them to be adjusted, if necessary, to make them correct within the limits of sensitiveness and to be stamped with the date of verification.

Working standard balances

8. (1) The Controller shall supply to every Inspector a set of working standard balances with each set of working standard weights.

(2) The types and specifications of such balances shall be as laid down in Schedule IV.

(3) The Controller shall cause to be verified such balances at least once in every twelve months and shall cause the same to be adjusted, if necessary, to make them correct within the limits of sensitiveness and to be stamped with the date of verification.

Commercial weights and measures

9. Commercial weights and measures of length and capacity shall conform as regards denominations, material used in construction and design to the specifications laid down in Schedule V.

Weighing and measuring instruments

10. (1) All weighing and measuring instruments used, or intended to be used, in transactions for trade or commerce shall conform as regards capacities, material and design, to the specifications laid down in Schedule VI and Schedule VII.

(2) The limits of error which may be tolerated in such weighing and measuring instruments during verification and inspection shall be as specified in Schedule VI and Schedule VII.

(3) Nothing in this rule shall apply to such class of weighing or measuring instruments as are in use at the commencement of these rules and for such period as may be specified in this behalf by the Government by Notification in the official Gazette—

Provided that—

(a) Where any capacity of any such instrument in terms of any weight or measures other than those of a standard mass or measure corresponds to any capacity of such instrument in terms of a standard mass or measure as specified in Schedule VI, the limits of error which may be tolerated in such cases shall be the same as are specified in relation to the corresponding capacity of such instrument in that schedule.

(b) Where any capacity of any such instrument in terms of any weight or measure other than those of standard mass or measure does not exactly correspond to any capacity of such instrument in terms of a standard mass or measure as specified in Schedule VI and Schedule VII the limits of errors and sensitiveness which may be tolerated shall be determined taking into account the limits of error and sensitiveness of the next higher and next lower capacities, and assuming the limits to be proportionate to capacity.

Display of Conversion Tables

11. Every trade shall display, at a conspicuous place in his business premises, copies, in the regional language and also in any other language ordinarily spoken or understood in the area, of conversion tables of weights, capacity and length or such of them as are applicable to his trade or business and of conversion tables of prices.

Stamping of Bullion Weights

12. (1) All weights for bullion and precious stones and all measuring instruments, used or intended to be used in transactions for trade or commerce, and all weighing instruments used for trade or commerce by a factory as defined in the Factories Act, 1948, shall be verified and stamped in accordance with the Regulation and the rules at least in a period of twelve months.

(2) All other weights, measures and weighing instruments used, or intended to be used, in transactions for trade or commerce shall be verified and stamped in accordance with the Regulation and these rules at least once in every period of twenty four months.

Provided that in the case of bullion and precious stones the said period shall be one year.

(3) Notwithstanding anything contained in sub-rule (1) or sub-rule (2) any weighing or measuring instrument which has been verified and stamped *in situ* shall, if it is removed and re-erected before the expiry of the period referred to in that sub rule, be verified and stamped in accordance with the Regulation and these rules on such removal or re-erection.

Notwithstanding anything contained in Rule II, any weight measure or weighing or measuring instrument which has been once verified and stamped in accordance with the Rule then in force may, where the State Government has by notification in the official gazette specified a period in this behalf, within that period, be reverified and stamped in accordance with the rules which were in force at the time of the first verification and stamping:

Provided that the period so specified shall in no case exceed ten years and may be different classes of weights, measures or weighing or measuring instruments.

Visit and other duties of Inspector

13. (1) An Inspector shall visit every factory and other places in the area under his charge where weights, measures, and weighing and measuring instruments are used, or kept for use, in transactions for trade or commerce, for verifying the same at least once during the period specified in rule II, and may also from time to time, make such surprise visits as he may deem necessary.

(2) All weights, measures, and weighing and measuring instruments shall be tested in a clean condition, and if necessary, the Inspector shall require the owner or user to clean them.

(3) Where a weight or measure or weighing or measuring instrument is brought to any Inspector for reverification, the Inspector shall deal with it in the same manner as upon verification but shall not be necessary for him to test a glass or earthenware measure, unless the original stamp has been defaced.

(4) The denomination or capacity of a weight, measure, weighing or measuring instrument, if not marked in full, shall be indicated by one of the abbreviations specified in Schedule VII.

Sealed packages containers, etc.

14. The limits of error which may be tolerated in the weight measure of an article sold or offered for sale in sealed packages or container shall be as specified in Schedule V.

Stamping of weights, etc.

15. (1) Before stamping any weight, measure or weighing or measuring instrument, the Inspector shall satisfy himself that such weight, measure weighing or measuring instrument complied with the requirements of the Regulation and these rules.

(2) Any weight, measure, weighing or measuring instrument presented for verification shall be complete in itself, and shall not be a manufacturer's or dealer's mark which might be mistaken for the Inspector's stamp.

(3) The Inspector shall stamp every weight, measure and weighing or measuring instrument with a stamp of uniform design issued by the Controller, indicating the area or district in which it has been stamped or Inspector by whom it is stamped or both:

Provided that —

(a) No weight, measure weighing or measuring instrument shall be stamped, which is not, in the opinion of the Inspector, sufficiently strong to withstand the wear and tear of ordinary use in trade; and

(b) no weighing or measuring instrument manufactured after the coming into force of these rules other than Class beam scales shall be stamped unless provided by the manufacturer with a plug or stud of soft metal on which place the Inspector's stamp, such plug or stud being made irremovable by undercutting or in some other suitable manner.

(4) The Inspector shall also mark the date of stamping on a weights, measures (other than glass, earthenware and enamel-metal measures) and weighing and measuring instruments, except when the size of such weight, measure or instrument makes it impracticable.

(5) On completion of verification and stamping, the Inspector shall issue a certificate of verification in the form specified in Schedule IX to the trader.

Transitional provisions

16. Weights, measures and weighing and measuring instrument which do not conform to the requirements of these rules but which conform to the requirements of the rules issued under the Madras weights and measures Act, 1948 (Act XXII of 1948) shall be verified and stamped, so far as may be, in accordance with these rules, as long as the use of such weights and measures and weighing and measuring instruments is permitted under the Standards of Weights and Measures Act, 1956, (Central Act, No. 89 of 1956).

Procedure for carrying out inspection, etc.

17. In carrying out his duties of inspection, verification and stamping of weights, measures and weighing and measuring instruments, in site the Inspector shall observe the procedure laid down in Section IX in addition to that laid down in Schedules V and VI.

Monthly Report of Inspector

18. Every Inspector shall submit a report to the Controller showing the work done by him, in a form approved by the Controller, as soon as he reaches the Head Quarters of the Controller or as soon as communication facilities permit him to do so.

Obliteration of stamps

19. The Inspector, on inspection, shall obliterate the stamp on—

(a) any weight, measure, or weighing or measuring instrument which cannot be made to conform to the requirements of these rules;

(b) any weight or measure, if it does not admit of proper adjustment owing to its being broken, indented or otherwise defective;

(c) Any weight or measure or weighing or measuring instrument which, since the last stamping, has been repaired or re-adjusted so as to cease to conform to the requirements of these rules;

(d) any weight or measure or weighing or measuring instrument due and not submitted for reverification and stamping;

(e) any weight or measure of length or capacity or a weighing or measuring instrument, if the error exceeds the limits allowed at the time of inspection:

Provided that where the error referred to in clause (e) is not, in the Inspector's judgement, such as to require the immediate obliteration of the stamp, he shall serve a notice on the trader, informing him of the defects found in the weight, measure or weighing or measuring instrument, and calling upon him to remove the defects within a stated period not exceeding eight days and shall—

(i) if the trader fails to have them corrected within that period, obliterate the stamp; or

(ii) if the weight, measure or weighing or measuring instrument is adjusted to remove the defects within the stated period, reverify the weight, measure or weighing or measuring instrument and stamp the same, if found correct;

Provided further that where the defect in a weighing instrument may be corrected by rebalancing, the stamp shall not be obliterated.

Verification under rule 19 after adjustment

20. A weight, measure or weighing or measuring instrument which on verification as provided in rule 11, is found to be incorrect shall be returned to the person concerned for adjustment. When the necessary adjustment has been carried out, such weight, measure or weighing or measuring instrument shall be re-verified and if found correct shall be stamped as laid down under Rule 19.

Exemption from levy of fees

21. No fees are to be levied for verification of stamping of weights and measures, in view of the poor economic condition of the Territory.

[Ministry of C&I Letter No. 15(19)/60 dated 3rd October 1961.]

Seizure, detention and disposal of unauthorised weights, measures and instruments

22(1) (i) weights and measures, beam scales, spring balances, counter machines and steel yard shall be liable to be seized and detained—

- they are not of the denominations specified in Schedules V and VI;
- they are false or defective;
- fraud is committed in using them;
- they are unstamped;
- the stamp on them is forged or transferred.

(ii) weighing and measuring instruments other than those specified in clause (i) shall be liable to seizure and detention in cases (b), (c) and (e) of that clause.

(2) Any weight or measure or weighing or measuring instrument seized and detained under this rule, which is not to be the subject of proceedings in a court, shall, after the expiry of the month after its seizure, be so dealt with as the Controller may by general special order direct, and the materials thereof shall be sold and the proceeds credited to the Government.

(3) Any weight or measure or weighing or measuring instrument seized and detained under this rule, which is to be the subject of proceedings in a court shall be produced by the Inspector before court and shall, after conclusion of the proceedings, be taken possession of by the Inspector and dealt with in accordance with the instructions issued by the Controller in this behalf.

Qualifications of Inspectors

23(1) No person shall be appointed as Inspector unless he—

- is able to speak, read and write one of the regional languages of the State; and
- on selection, has satisfactorily completed at least six weeks' training in a Department of Government responsible for the Enforcement of Weights and Measures.

(2) Nothing in sub-rules (1) and (ii) shall apply to persons who have been working as Inspectors for a period of not less than a year immediately before the commencement of these rules.

Duties of Inspectors

24. The duties of an Inspector are—

- verification and stamping of weights and measures, etc;
- inspections;
- submission of the reports and returns prescribed in the rules or required by the Controller;
- safe custody of articles seized and detained in the course of his duty;
- safe and proper custody of the secondary and working standards and other equipment entrusted to his charge;
- maintenance of such books as may be specified by the Controller.
- such other duties under the Regulation and Rules as the Controller by special or general order specify.

Inspectors to be provided with working standards balances, etc.

Rule 25—

25. Every Inspector shall be provided by the Controller with:—

(1) working standards, balances for testing weights, adequate instrumental equipment, travelling kit for inspection of such material and form as may from time to time be necessary.

(2) such dies, punches, stencil plates brading irons, etching and graving and other implements as may be necessary for affixing verification stamp, the design and number of which shall be furnished by him.

(3) Purchase of suitable eight pointed star design as shown in the illustration below for the purpose of obliterating the stamps.

Licensing of manufacturers, repairers and dealers of weights, measures etc.

26. (1) Every manufacturer or repairer of, or dealer in, weights, measures or weighing and measuring instruments shall obtain a licence from the Controller in the form set out in Schedule XIII. A licence may be renewed from year to year.

(2) The fees payable for such licence and its renewal shall be as specified in Schedule XIV.

(3) The Controller may, by order, refuse to grant or renew the licence or suspend or cancel the licence of a manufacturer or repairer of, or dealer in, weights, measures, weighing and measuring instruments on the ground of want of proper and adequate workshop facilities or staff or incompetency or failure to observe any provisions of the Regulation or these rules:

Provided that no such order shall be made without giving the aggrieved person an opportunity of stating his case.

(4) The Controller shall maintain a register of licensed manufacturers, repairers and dealers in the form set out in Schedule XV.

Records to be maintained by manufacturer etc.

27. Every manufacturer or repairer of, or dealer in, weights, measures or weighing and measuring instruments shall maintain such records in such form and submit such returns as the Controller may direct.

Certificate of verification to be exhibited

28. The person to whom a certificate of verification is issued shall exhibit the same in a conspicuous place in the premises where the weights, measures or weighing or measuring instruments to which the certificate relates are used. Provided that in the case of a hawker, the certificate shall be kept on his person.

29.

30.

Penalty

31. Any person who contravenes any provision of these rules shall be punishable with fine which may extend to one hundred rupees.

M. RAMUNNY
Administrator

INDEX TO SCHEDULES

| Schedule No. and part No. | Subject | Page No |
|---------------------------|--|---------|
| Schedule I .. | Denomination, material, shapes, permissible errors of secondary standards and measures— | |
| | 1. Secondary standard weights .. | 16 |
| | 2. Secondary standard capacity measures .. | 16 |
| | 3. Secondary standard length measures .. | 16 |
| Schedule II .. | Denomination, material, shape, permissible errors for working standards of weights and measures— | |
| | 1. Working standard weights .. | 16 |
| | 2. Working standard capacity measures .. | 17 |
| Schedule III .. | Specification for Secondary standard balances .. | 17 |
| Schedule IV .. | Specification for working standard balances .. | 17 |
| Schedule V .. | Specification for commercial weight and measures of length and capacity— | |
| Part I .. | Commercial weights .. | 18 |
| Part II .. | Commercial cast weights .. | 20 |
| Part III .. | Commercial liquid capacity measures .. | 21 |
| Part IV .. | Special measures for Petroleum products .. | 22 |
| Part V .. | Dispensing measures .. | 22 |
| Part VI .. | Commercial length measures .. | 23 |
| Part VII .. | Woven metallic tape measures .. | 24 |
| Part VIII .. | Steel tape measures (winding tape) .. | 25 |
| Part IX .. | Surveying chains .. | 25 |
| Schedule VI .. | Specifications for commercial weighing instruments— | |
| Part I .. | General requirements .. | 26 |
| Part II .. | Beam scales .. | 26 |
| Part III .. | Counter machines .. | 29 |
| Part IV .. | Steel yards .. | 29 |
| Part V .. | Platform weighing machines .. | 30 |
| Part VI .. | Spring Balances .. | 31 |
| Part VII .. | Weigh bridges .. | 32 |
| Part VIII .. | Crane weighing machines .. | 33 |
| Part IX .. | Automatic weighing machines .. | 34 |
| Part X .. | Self Indicating and semi-self indicating counter type weighing machines .. | 35 |
| Part XI .. | Person weighing machines .. | 35 |
| Schedule VII .. | Specifications for commercial measuring instruments— | |
| Part I .. | General requirements .. | 36 |
| Part II .. | Dispensing pumps .. | 36 |
| Schedule VIII .. | Abbreviations of Denominations .. | 37 |
| Schedule IX .. | Certificate of verification and stamping of weights & measures .. | 38 |
| Schedule X .. | Maximum permissible errors in Net weight or measure of packed commodities .. | 39 |
| Schedule XI .. | Procedure to be followed for Inspection, verification and stamping of commercial weighing and measuring instruments used or for use in transactions— | |
| Part I .. | Weights & measures .. | 39 |
| Part II .. | Weighing and measuring instruments .. | 39 |
| Part III .. | Calibration of vehicle tanks for petroleum products and other liquids .. | 39 |
| Schedule XII .. | Dry measures .. | 40 |
| Schedule XIII .. | Licensing forms .. | 41 |
| Schedule XIV .. | Licensing and removal fees for manufacturers, repairers or dealers of weights, measures, weighing and measuring instruments .. | 42 |
| Schedule XV .. | Register of licensed manufacturers/repairers/dealers .. | 42 |

SCHEDULE I

Denominations, Material, Shape, Permissible errors of Secondary Standards of Weights and Measures

(See Rule 4)

1. Secondary Standard Weights

Denominations

| Kilogram Series | | | | | Gram series | Milligram series. |
|-----------------|----|----|----|----|-------------|-------------------|
| 10 | .. | .. | .. | .. | 500 | 500 |
| 5 | .. | .. | .. | .. | 200 | 200 |
| | | | | | 100 | 100 |
| 2 | .. | .. | .. | .. | 50 | 50 |
| | | | | | 20 | 20 |
| | | | | | 10 | 10 |
| 1 | .. | .. | .. | .. | 5 | 5 |
| | | | | | 2 | 2 |
| | | | | | 1 | 1 |

Material

(a) Weights of 10 k.g. to 1 k.g. shall be cast from admiralty bronze of the following composition:

| Constituent | percent. | | | | | | |
|----------------|----------|----|----|----|----|----|---------------|
| Tin | .. | .. | .. | .. | .. | .. | 9.50 to 10.50 |
| Zinc | .. | .. | .. | .. | .. | .. | 1.50 to 2.50 |
| Lead (Max) | .. | .. | .. | .. | .. | .. | 0.50 |
| Nickel (max) | .. | .. | .. | .. | .. | .. | 1.00 |
| Other elements | .. | .. | .. | .. | .. | .. | 0.15 |
| Total (max) | .. | .. | .. | .. | .. | .. | |
| Copper | .. | .. | .. | .. | .. | .. | Remainder |

(b) Weights of 500 mg to 50 mg shall be made of copper 79 to 81 per cents, nickel 19 to 21 per cent total impurities not to exceed 1.5 per cent, having a nominal composition of 75 per cent copper and 25 per cent nickel.

(c) Weights of 20 mg to 1 mg shall be made of commercially pure aluminium sheets. Copper silicon and iron contained as impurities in commercially pure aluminium shall not exceed 0.03 per cent.

Shape

(a) For kilogram and gram series—Integral cylindrical body with knobs flattened at the top. Weights of 10 kg. to 100 kg. (inclusive) shall have adjusting devices. Lead shall not be used as an adjusting material.

(b) For milligram series, the weights shall be in the form of square sheets, one of the corners being bent at right angles.

(c) The denominations shall be marked on the weights.

Permissible Errors

The permissible errors in excess and in deficiency shall be as follows:—

| Denomination | Permissible Error | |
|--------------|-------------------|-------------------|
| | in excess mg. | in deficiency mg. |
| 10 kg | 50 | 25 |
| 5 kg | 25 | 12.5 |
| 2 kg | 15 | 7.5 |
| 1 kg | 10 | 5 |
| 500 g | 5 | 2.5 |
| 210 g | 4 | 2 |
| 100 g | 3 | 1.5 |
| 50 g | 2 | 1 |
| 20 g | 1.5 | 0.75 |
| 10 g | 1 | 0.5 |
| 5 g | 0.8 | 0.4 |
| 2 g | 0.6 | 0.3 |
| 1 g | 0.4 | 0.2 |
| 500 mg | 0.4 | 0.2 |
| 200 mg | 0.2 | 0.1 |
| 100 mg | 0.2 | 0.1 |
| 50 mg | 0.1 | 0.05 |
| 20 mg | 0.1 | 0.05 |
| 10 mg | 0.05 | 0.02 |
| 5 mg | 0.05 | 0.02 |
| 2 mg | 0.05 | 0.02 |
| 1 mg | 0.02 | 0.02 |

2. Secondary Standard Capacity Measures

Denominations

| Litre series (l) | | | | | | Millilitre series (ml) |
|------------------|----|----|----|----|----|------------------------|
| 5 | .. | .. | .. | .. | .. | 500 |
| 2 | .. | .. | .. | .. | .. | 200 |
| 1 | .. | .. | .. | .. | .. | 100 |
| | | | | | | 50 |
| | | | | | | 20 |

Material

Secondary measures of capacity shall be cast out of admiralty bronze of the same composition as is employed in the case of secondary standard weights.

Shape

(a) The 5 litre measure shall be cylindrical and have its inside diameter equal to the height of the measure. This shall have two handles attached securely to its sides.

(b) Measures of 2 litres and below shall be of the same shape as above but shall not have any handles.

(c) The denominations of the measures shall be engraved on the outside surface.

(d) Each set of measures shall be supplied with specially selected striking glasses.

Permissible Errors.—The permissible errors in excess and deficiency shall be as follows:—

| Denomination | Permissible Error | |
|--------------|-------------------|---------------|
| | in excess | in deficiency |
| 5 l | 8 g | 8 g |
| 2 l | 2 | 2 |
| 1 l | 1 | 1 |
| 500 ml | 0.8 | 0.8 |
| 200 ml | 0.5 | 0.5 |
| 100 ml | 0.4 | 0.4 |
| 50 ml | 0.3 | 0.3 |
| 20 ml | 0.2 | 0.2 |
| | 0.1 | 0.1 |

3. Secondary Standard length measures

1. Material

58 per cent nickel-steel.

2. Section

Rectangular cross section with dimensions 38 mm×15 mm. The top surface shall have two rectangular grooves, along its length.

3. Overall length

1030 mm.

4. Graduated length

1010 mm.

5. Finish

Bright, highly polished.

6. Graduations

Graduated in mm. throughout.

7. Thickness or Graduation Marks

Not less than 30 microns and not more than 50 microns.

8. Tolerance

(i) The maximum permissible errors in the graduations shall be (i) +25 microns between any 2 adjacent Millimetre marks, provided that the error between any two consecutive centimetre marks also not exceed ±25 microns.

(ii) ±50 microns between any two marks more than 10 cm. apart.

SCHEDULE II

(See Rule 5)

Denominations, Material, shape permissible errors for working standards of weights and measures

I. WORKING STANDARD WEIGHTS

| Denominations | | | | | Gram series | Milligram series |
|-----------------|----|----|----|----|-------------|------------------|
| Kilogram series | | | | | | |
| 20 | .. | .. | .. | .. | 500 | 500 |
| 20 | .. | .. | .. | .. | 200 | 200 |
| 10 | .. | .. | .. | .. | 100 | 100 |
| 5 | .. | .. | .. | .. | 50 | 50 |
| 2 | .. | .. | .. | .. | 20 | 20 |
| 1 | .. | .. | .. | .. | 10 | 10 |
| | | | | | 5 | 5 |
| | | | | | 2 | 2 |
| | | | | | 1 | 1 |

Material

2. WORKING STANDARD CAPACITY MEASURES

(a) Weights of 20 k.g. to 1 g shall be cast from admiralty bronze or cupro-nickel of the following compositions:—

Admiralty Bronze

| Constituent | | | | | | percent |
|------------------|--|--|--|--|--|---------------|
| Tin | | | | | | 9.50 to 10.50 |
| Zinc | | | | | | 1.50 to 2.50 |
| Lead (Maximum) | | | | | | 0.50 |
| Nickel (Maximum) | | | | | | 1.00 |
| Other elements | | | | | | 0.15 |
| Total (maximum) | | | | | | |
| Copper | | | | | | Remainder |

Cupro-Nickel

- Copper 79 to 81 per cent 75.
- Nickel 19 to 21 per cent 25.
- Total impurities not to exceed 1.5 per cent.
- (b) Weights of 500 mg to 100 mg shall be made of admiralty bronze (rolled) sheets. (Composition as in (a) above).
- (c) Weights of 50 mg to 1 mg shall be made out of commercially pure aluminium sheets. Copper silicon and iron contained as impurities in commercially fine aluminium shall not exceed 0.03 per cent.

Shape

- (a) Weights of 20 kg and 10 kg shall be cylindrical in shape and shall be cast in two halves, the top half being screwed snugly into the bottom half. The top half shall be cast in the form of a handle for lifting purposes. The two halves after assembly shall be locked by means of a set-screw over which the seal of the verifying authority shall be stamped.
- (b) Weights of 5 kg. to 200 g (inclusive) shall be cast in two halves, the top half being screwed snugly into the bottom half. The top half shall be cast in the form of a knob for lifting purposes. The two halves, after assembly shall be locked by means of a Set-screw, over which the seal of the verifying authority shall be stamped.
- (c) Weights of 100 g to 10 g shall be as (b) above except that there shall be no locking arrangement.
- (d) Weights of 5 g to 1 g shall be integral solid weights.
- (e) Weights of 500 mg to 1 mg (inclusive) shall be of square shape with one of the sides bent at right angles to the left surface for ease of handling.
- (f) The denomination shall be marked on the weights.

Permissible Errors

The permissible errors in excess and in deficiency shall be as follows:—

| Denomination | Permissible errors | |
|--------------|--------------------|----------------------|
| | in excess mg. | in deficiency mg. |
| 20 kg | 200 | 100 |
| 10 kg | 100 | 50 |
| 5 kg | 50 | 25 |
| 2 kg | 30 | 15 |
| 1 kg | 20 | 10 |
| 500 g | 10 | 5 |
| 200 g | 8 | 4 |
| 100 g | 6 | 3 |
| 50 g | 4 | 2 |
| 20 g | 3 | 1.5 |
| 10 g | 2 | 1 |
| 5 g | 1.6 | 0.8 |
| 2 g | 1.2 | 0.6 |
| 1 g | 0.8 | 0.4 |
| 500 mg | 0.8 | 0.4 |
| 200 mg | 0.4 | 0.2 |
| 100 mg | 0.4 | 0.2 |
| 50 mg | 0.2 | 0.1 |
| 20 mg | 0.2 | 0.1 |
| 10 mg | 0.1 | 0.05 |
| 5 mg | 0.1 | 0.05 |
| 2 mg | 0.1 | 0.05 |
| 1 mg | 0.05 | 0.05 |

Denominations

| Litre series (l) | | | | | | Millilitre series(ml) |
|------------------|----|----|----|----|----|-----------------------|
| 10 | .. | .. | .. | .. | .. | 500 |
| 5 | .. | .. | .. | .. | .. | 200 |
| 2 | .. | .. | .. | .. | .. | 100 |
| 1 | .. | .. | .. | .. | .. | 50 |
| | .. | .. | .. | .. | .. | 20 |

Material of Construction

Working capacity standards shall be pressed out of oxygen free, deoxidised annealed copper sheets of deep drawing quality.

Shape

- (i) Working standard capacity measures of 10 litres shall be cylindrical with the handles securely fixed to the sides.
- (ii) All other working standard capacity measures shall also be cylindrical, but shall not be provided with handles. The diameter of each measure shall approximately be equal to the height of the measure. The measures shall be suitably reinforced.
- (iii) The denominations of the working standard measures shall be engraved on the outside surface
- (iv) The outside of the body of the working standard measure shall be exdised to give a smooth dull black surface and the inside shall be tinned.
- (v) Each set of working standard capacity measures shall be supplied with specially selected striking glasses and the measures and glasses shall be securely packed in velvet lined teakwood boxes

Permissible Errors

| Denomination | permissible errors | |
|--------------|--------------------|--------------------------|
| | in excess (in ml) | in deficiency in (ml) |
| 10 l | 8 | 8 |
| 5 l | 4 | 4 |
| 2 l | 2 | 2 |
| 1 l | 1.5 | 1.5 |
| 500 ml | 1.00 | 1.0 |
| 200 ml | 0.8 | 0.8 |
| 100 ml | 0.6 | 0.6 |
| 50 ml | 0.4 | 0.4 |
| 20 ml | 0.2 | 0.2 |

SCHEDULE III

(See Rule 7)

Specifications for Secondary Standard Balances

| Capacity | sensitiveness in mg/division of scale |
|----------|---|
| 20 kg | 50 |
| 5 kg | 10 |
| 1 kg | 5 |
| 200 g. | 1 |
| 2 g. | 0.02 |

NOTE:—

- Secondary standard balances shall be used only for indoor work in laboratories.
- The balances shall be relieved when not in operation.

SCHEDULE IV

(See Rule 8)

Specifications for Working Standard Balances

1. Range of Balances

| Capacity | Sensitiveness mg/division of scale | approximate beam length |
|----------|--|----------------------------|
| 50 kg. | 100 | 750 mm. |
| 5 kg. | 10 | 250-330 mm. |
| 200 g. | 1.0 | 150-200 mm. |
| 2 g. | 0.02 | 120-150 mm. |

2. Types

Working standard balances shall be of both indoor and outdoor types.

3. Design and construction—

The balances shall be constructed on non-magnetic materials and shall be robust in construction. They shall be capable of being easily assembled. Outdoor type balances shall be fitted in suitable carrying cases to enable the balances to withstand rough transport conditions. Smaller balances i.e. capacity 5 kg. and below shall be provided with glass cases. Portable balances of capacity 5 kg. and below shall be fitted into one carrying case for ease of transportation.

SCHEDULE V

(See Rule 9)

Specifications for Commercial Weights and Measures of Length and Capacity

PART I—COMMERCIAL WEIGHTS OTHER THAN CARAT WEIGHTS

1. Denominations—

The denominations of the different types of weights shall be as follows:—

(a) Iron and steel weights—

| | | | | |
|--------|----|----|----|-------|
| 50 kg. | .. | .. | .. | 500 g |
| 20 kg | .. | .. | .. | 200 g |
| 10 kg | .. | .. | .. | 100 g |
| 5 kg | | | | |
| 2 kg | | | | |
| 1 kg | | | | |

(b) Brass and Bronze weights—

| Bullion. | | | | other than bullion. | | | |
|----------|-------|----|----|---------------------|------|-------|--|
| 20 kg | 500 g | .. | .. | .. | 1 kg | 500 g | |
| 10 kg | 200 g | .. | .. | .. | | 200 g | |
| 5 kg | 100 g | .. | .. | .. | | 100 g | |
| 2 kg | 50 g | .. | .. | .. | | 50 g | |
| 1 kg | 20 g | .. | .. | .. | | 20 g | |
| | 10 g | .. | .. | .. | | 10 g | |
| | 5 g | .. | .. | .. | | 5 g | |
| | 2 g | .. | .. | .. | | 2 g | |
| | 1 g | .. | .. | .. | | 1 g | |

(c) Sheet Metal Weights (Bullion and other than Bullion)

| |
|---------|
| 500 mg. |
| 200 mg |
| 100 mg |
| 50 mg |
| 20 mg |
| 10 |
| 5 |
| 2 |
| 1 |

The actual series to be used in practice shall consist of two weights of denominations 2, 20 or 200.

2. Iron and Steel Weights—

(a) Materials—Weights of 50 kg. and down to and including 5 kg shall be made only of cast iron. Weights of 2 kg and down and including 100 g shall either be made of cast iron or forged mild steel.

(b) Shapes and dimensions—The shapes and dimensions of cast iron weights shall conform to Figs. 1 and 2 read with tables 1 and 2 and those of mild steel conform to Fig. 2 read with table.

Figure 1. Figure 2.
Fig. 1 cast iron weight with castin handle Fig. 2 cast Iron or Forged mild steel weight.

Table 1—Dimensions of cast iron weights with handle

| Denomination | A | B | C | D | E | G | P | Q | R | S | D | |
|--|----|-----|-----|-----|-----|-----|----|----|----|----|-----|----|
| 50 kg | .. | 236 | 253 | 134 | 170 | 100 | 27 | 58 | 48 | 24 | 102 | 32 |
| 20 kg. | .. | 188 | 200 | 112 | 113 | 90 | 21 | 44 | 38 | 10 | 66 | 22 |
| 10 kg. | .. | 152 | 161 | 92 | 88 | 74 | 18 | 36 | 30 | 15 | 54 | 10 |
| 5 kg. | | 125 | 132 | 75 | 65 | 62 | 15 | 29 | 25 | 12 | 40 | 16 |
| All dimensions in millimetres. | | | | | | | | | | | | |
| Tolerance on dimensions \pm 5 per cent | | | | | | | | | | | | |

Table 2 Dimensions of cast iron or forged Mild Steel Weights

| Denomination | | A | B | C | D | H | P | Q | R | S | T |
|--------------|----|----|-----|----|----|----|----|----|---|----|-----|
| 2 kg. | .. | 94 | 101 | 76 | 40 | 10 | 34 | 30 | 9 | 18 | 4 |
| 1 kg. | .. | 73 | 79 | 60 | 34 | 8 | 32 | 28 | 8 | 16 | 4 |
| 500 g | .. | 57 | 62 | 46 | 27 | 6 | 23 | 20 | 6 | 13 | 3 |
| 200 g | .. | 43 | 47 | 36 | 21 | 6 | 22 | 20 | 4 | 9 | 3 |
| 100 g | .. | 34 | 36 | 28 | 16 | 4 | 18 | 16 | 3 | 7 | 2.5 |

(a) for weights above 1 kg. ± 5 per cent.

(b) for weights 1 kg. and below+10 per cent.

All dimensions in millimeters.

Tolerance on dimensions:

(c) Cast-in-Handles—Weights of denominations of 50 kg. and including 5 kg. shall be provided with cast-in-handles made of mild steel which may conform to steel designation B of IS: 226-1955.

(d) Nesting of Weights—Weights of denominations of 2 kg. and down to and including 100 g shall nest reach others.

(e) Loading Holes—Weights with cast-in-hand (see Fig. 1) shall have one rectangular loading hole on the under surface, tapering outside along the width while the nesting weights (see Fig. 2) shall have one round loading hole, tapering outwards in the centre of the underside.

(f) Permissible errors.

| Domination | Verification | | Inspection | |
|------------|-----------------------|--------|------------------|------------|
| | errors in excess only | | Excess | Deficiency |
| | | mg. | | mg. |
| 50 kg | .. | 20,000 | | 10,000 |
| 20 kg | | 10,000 | | 5,000 |
| 10 kg | .. | 5,000 | error same as in | 2,500 |
| 5 kg | | 3,000 | verification. | 1,500 |
| 2 kg | | 1,600 | | 800 |
| 1 kg | | 1,000 | | 500 |
| 500 g. | | 600 | | 300 |
| 200 g | | 400 | | 200 |
| 100 g | | 320 | | 160 |

NOTE:- New weights, when presented for checking and stamping, shall not weigh less than the denomination value plus 50 per cent of the excess tolerance shown above.

3. Brass and Bronze Weights—

(a) Materials—The weights shall be made of cast brass or cast bronze, or processed from rods.

(b) Shapes and Dimensions—Brass and bronze weights shall be of the following types:—

1. Bullion weights.

(i) Weights of 20 kg. down to and including 200 g shall be marked with the words 'Bullion' "बुलियन" with a diamond as shown in figures 3 and 4 and weights of 100 g down to and including 10 g shall be marked with only a diamond cylindrical in shape, with a handle for 20 kg and 10 kg. weights and a knob for the rest of the denominations shapes and dimensions shall conform to Fig. 3 and 4 read with tables 3 and 4, respectively. Weights of 20 kg. down to and including 20 g shall be marked with the word 'Bullion' and "बुलियन" a 'diamond' as shown in Figs. 3 and 4, and weights of 100 g and below shall be marked with only a diamond.

Fig. 3 Fig. 4
Fig. 3—Cylindrical bullion weights with handle Fig. 4—Cylindrical bullion weights with knob

Table 3—Dimensions of Cylindrical Bullion Weights with Handle

| Denominations | A | B | C | D | E | F | G | H | L | J | K | S | |
|---------------|----|-----|-----|----|-----|----|----|----|----|----|----|----|----|
| 20 kg | .. | 133 | 157 | 71 | 106 | 41 | 16 | 55 | 51 | 25 | 26 | 14 | 25 |
| 10 kg | .. | 106 | 130 | 64 | 85 | 33 | 14 | 50 | 49 | 25 | 26 | 13 | 25 |

All dimensions in millimetres

Tolerance on dimensions ±. 5 per cent.

Table 4—Dimensions of Cylindrical Bullion Weights with Knob

| Denomina- tion. | A | B | C | D | E | F | G | H | L | J |
|-----------------|----|----|------|----|------|------|------|------|----|------|
| 5 kg. | 86 | 88 | 41 | 56 | 37.5 | 22.5 | 18.5 | 38 | 19 | 20 |
| 2 kg. | 64 | 67 | 27 | 39 | 24 | 14 | 13 | 27 | 17 | 17.5 |
| 1 kg. | 50 | 50 | 23.5 | 33 | 21 | 12 | 11.5 | 25 | 16 | 17 |
| 500 g. | 41 | 39 | 20 | 25 | 17 | 10.5 | 8.5 | 19 | 16 | 17 |
| 200 g. | 32 | 29 | 16 | 20 | 12 | 9 | 7 | 13.5 | 13 | 13.5 |
| 100 g. | 24 | 24 | 12 | 17 | 9.5 | 6 | 6 | 11 | 11 | 12 |

Table 1—contd.

| | | | | | | | | | | |
|-------|----|----|----|----|---|-----|-----|----|-----|----|
| 50 g. | 19 | 19 | 10 | 14 | 8 | 5 | 5 | 9 | 9.5 | 10 |
| 20 g. | 14 | 14 | 6 | 10 | 6 | 3 | 3 | 6 | 6 | 7 |
| 10 g. | 11 | 11 | 5 | 8 | 5 | 3 | 2 | .. | .. | .. |
| 5 g. | 9 | 9 | 4 | 6 | 4 | 2 | 2 | .. | .. | .. |
| 2 g. | 6 | 6 | 3 | 4 | 2 | 1.5 | 1.5 | .. | .. | .. |
| 1 g. | 6 | 6 | 2 | 3 | 1 | 1 | 1 | .. | .. | .. |

All dimensions in millimetres.

Tolerance on dimensions:

(a) for weights above 1 kg.+5 per cent.

(b) for weights 1 kg. and below +10 per cent.

(ii) Weights of denominations 1 kg. and down to and including 1 g. shall be flat cylindrical in shape (without a knob) and shall nest with each other. Shapes and dimensions shall conform to Fig. 5 read with Table 5. Weights of 1 kg. and down to and including 20 g. shall be marked with the words 'Bullion' and 'बुलियन' with 'diamond' as shown in Fig. 5 and weight of 10 g. and below down to and including 1 g. shall be marked with only a diamond.

Fig. 5 flat cylindrical Bullion weight.

Tables 5—Dimensions of Flat Cylindrical Bullion Weights

| Denominations | .. | A | B | C | D | E | F | G | H |
|---------------|----|------|------|-----|-----|-----|------|------|----|
| 1 kg. | .. | 82.5 | 66.5 | 16 | 16 | 3 | 8.0 | 24 | 17 |
| 500 g. | .. | 65 | 49.5 | 16 | 13 | 2.5 | 7.75 | 19 | 17 |
| 200 g. | .. | 48.0 | 38.5 | 13 | 9.5 | 2.5 | 4.75 | 14 | 14 |
| 100 g. | .. | 37.5 | 29.5 | 11 | 7 | 2 | 4 | 11.5 | 12 |
| 50 g. | .. | 28.5 | 22.5 | 9.5 | 6 | 1.5 | 3 | 10.5 | 10 |
| 20 g. | .. | 21.5 | 17.5 | 8 | 4 | 1.5 | 2.0 | 7 | 8 |
| 10 g. | .. | 16.5 | 13.5 | .. | .. | 1 | 1.5 | 6 | .. |
| 5 g. | .. | 12.5 | 10.5 | .. | .. | 1.0 | 1 | 5 | .. |
| 2 g. | .. | 10 | 8 | .. | .. | 0.5 | 1 | 4 | .. |
| 1 g. | .. | 7.5 | .. | .. | .. | .. | .. | 2.5 | .. |

All dimensions in millimetres.

Tolerance on dimensions +10 per cent.

(iii) Other than bullion weights—(For supplementing the iron and steel series) Weights of denominations 1 kg. and down to and including 1 g. shall be flat cylindrical in shape and shall have a distinct downward taper. Shapes and dimensions shall conform to Fig. 6 read with Table 6.

FIG. 6

FIG. 6 flat cylindrical weight.

Table 6—Dimensions of Flat Cylindrical Weights

| Denomination | .. | A | B | C | D | E | F | G | J |
|--------------|----|------|------|----|------|-----|-----|------|----|
| 1 kg. | .. | 84.5 | 58 | 16 | 76 | 4 | 15 | 25.5 | 20 |
| 500 g. | .. | 64 | 46.5 | 16 | 56 | 3 | 14 | 23 | 20 |
| 200 g. | .. | 50 | 34.5 | 13 | 45 | 2.5 | 9.5 | 15 | 15 |
| 100 g. | .. | 38 | 26 | 11 | 33.5 | 2 | 9.5 | 13 | 13 |
| 50 g. | .. | 29 | 20.5 | 10 | 25 | 2 | 8 | 11.5 | 12 |
| 20 g. | .. | 22 | 16.5 | 8 | 19.5 | 1 | 4 | 8 | 10 |
| 10 g. | .. | 17.5 | 12.5 | .. | 16 | 1 | .. | 6 | .. |
| 5 g. | .. | 13 | 10 | .. | 11 | 1 | .. | 5 | .. |
| 2 g. | .. | 10 | 7.5 | .. | 9 | 0.5 | .. | 3.5 | .. |
| 1 g. | .. | 8 | .. | .. | 6.5 | .. | .. | 2.5 | .. |

All dimensions in millimetres.

Tolerance on dimensions +10 per cent.

(d) Permissible Errors—

| Denomina- tion | Verification errors in excess only. | | Inspection | | | |
|-------------------|--|---------------------------|--------------|-----------------|---------------------------------|-----------------|
| | Bullion weights | other than bullion wts | Bullion wts. | | Other than bul- lion weights | |
| | | | excess | defi- ciency | excess | defici- ency |
| | mg. | mg. | mg. | mg. | mg | mg. |
| 20 kg. | 500 | .. | Error | 250 | Error | .. |
| 10 | 250 | .. | Same | 125 | Same | .. |
| 5 | 150 | .. | as in veri- | 75 | as in veri- | .. |
| 2 | 80 | .. | fication. | 40 | fication. | .. |
| 1 | 50 | 250 | | 25 | | 125 |
| 500 g. | 30 | 150 | | 15 | | 75 |
| 200 | 20 | 100 | | 10 | | 50 |
| 100 | 16 | 80 | | 8 | | 40 |
| 50 | 12 | 60 | | 6 | | 30 |
| 20 | 10 | 50 | | 5 | | 25 |
| 10 | 8 | 40 | | 4 | | 20 |
| 5 | 6 | 30 | | 3 | | 15 |
| 2 | 4 | 20 | | 2 | | 10 |
| 1 | 2 | 10 | | 1 | | 5 |

Sheet Metal Weights—

(a) Materials—Sheet metal weights shall be made of stainless steel, aluminium, brass or nickel silver sheets.

(b) Shapes and Dimensions

(i) Other than bullion weights—After bending along one of the sides (see Fig. 7) the weights shall have the dimensions given in Table 7 and the following shapes:—

| Denomination | Shape | | | |
|--------------|-------|----|----|-----------|
| 500, 50, 5 | .. | .. | .. | Hexagon. |
| 200, 20, 2 | .. | .. | .. | Square. |
| 100, 10, 1 | .. | .. | .. | Triangle. |

FIG 7—Sheet Metal weights.

Table 7—Dimensions of sheets metal weights

| Denomination mg. | B1 | B2 | B3 | H | G |
|---------------------|-----|-----|-----|-----|-----|
| 500 | .. | .. | 12 | 4 | 2 |
| 200 | .. | 9.0 | .. | 3.5 | 2 |
| 100 | 9.0 | .. | .. | 3.5 | 2 |
| 50 | .. | .. | 9.5 | 3 | 1.5 |
| 20 | .. | 6.4 | .. | 2.5 | 1.5 |
| 10 | 6.4 | .. | .. | 2 | 1.5 |
| 5 | .. | .. | 6.3 | 2 | 1 |
| 2 | .. | 3.6 | .. | 2 | 1 |
| 1 | 3.6 | .. | .. | 2 | 1 |

All dimensions in millimetres.

Tolerance on dimensions +10 per cent.

(ii) Bullion Weights—When intended for use in the bullion trade, sheet metal weights shall, after bending, have circular shape; their diameters shall be as given in Fig. 8 read with Table 8.

FIG. 8 sheet metal bullion weight.

TABLE 8—Dimensions of Sheet Metal Weights (Bullion)

| Denomination | D | | | C | H |
|--------------|----|----|----|-------|-----|
| 500 mg. | .. | .. | .. | 11.0 | 2 |
| 200 | .. | .. | .. | 10.00 | 2 |
| 100 | .. | .. | .. | 9.0 | 2 |
| 50 | .. | .. | .. | 8.0 | 1.5 |
| 20 | .. | .. | .. | 6.3 | 1.5 |
| 10 | .. | .. | .. | 5.6 | 1.5 |
| 5 | .. | .. | .. | 5.0 | 1.0 |
| 2 | .. | .. | .. | 4.0 | 1.0 |
| 1 | .. | .. | .. | 3.2 | 1.0 |

All dimensions in millimetres.

Tolerance on dimensions +10 per cent.

(c) Loading Holes—Weights of denominations 20 Kg. and down to and including 20 g. shall have a round loading hole, tapering outwards in the centre of the underside (see Figs. 3, 4, 5 and 6).

(c) Permissible Errors—

| Denomina- tion. | Verifica- tion | | Errors in excess only | | Inspection | | | |
|--------------------|-------------------|-----|-----------------------------|-----------------------|--------------------|--------------|-------------------------------|--------------|
| | Bullion Wts. | | Other than bullion Wts. | | Bullion weights | | Other than bullion weights | |
| | mg. | mg. | mg. | | excess mg. | Defy. mg. | excess mg. | Defy. mg. |
| 500 | 1.6 | | 3.00 | Error | 0.8 | | Error | 0.4 |
| 200 | 1.2 | | 6.0 | same as | 0.6 | | same as | 3.0 |
| 100 | 0.8 | | 4.0 | in veri- fication. | 0.4 | | in veri- fication. | 2.0 |
| 50 | 0.4 | | 2.0 | | 0.2 | | | 1.0 |
| 20 | 0.4 | | 2.0 | | 0.2 | | | 1.0 |
| 10 | 0.2 | | 1.0 | | 0.1 | | | 0.5 |
| 5 | 0.2 | | 0.4 | | 0.1 | | | 0.2 |
| 2 | 0.2 | | 0.2 | | 0.1 | | | 0.1 |
| 1 | 0.1 | | 0.1 | | 0.05 | | | 0.05 |

5. Manufacture and Finish—

General—When the weights are cast, the castings shall be reasonably smooth, and free from dress, pits, blow holes and other defects. When the weights are made by machining or turning, the surface shall be reasonably smooth. Sheet metal weights shall be clearly sheared and shall be free from burrs. Cast iron and forged weights shall be coated with a thin film of suitable black paint or varnish.

The raised marking on weights shall be clean and legible. The stamped markings on sheet metal weights shall be legible and deep enough to ensure indelibility over a long period, but not so deep as to crack the sheet.

When lead is used in adjusting weights, it shall be so fitted as to ensure that it does not dislodge itself under normal conditions of use.

The steel handles of cast iron weights shall be rigidly fixed.

6. Marking—

Every weight, except weights of 10 g. and lower denominations, shall have the manufacturer's name or trade mark indibly cast or stamped on it.

The denominations shall be indicated in an indelible manner, with the abbreviations 'kg' and "किलो" to indicate kilogram 'g' and "ग्राम" to indicate gram and 'mg' and "मिली" to indicate milligram. The size of numerals and letters and on bullion weights with knobs of denomination 5 g. and below (letters need not be stamped on weights 50 g. and below) indicating denominations of weights shall be at least twice the size of letters indicating the manufacturer's name or trade mark. The numerals used in the denomination shall be only Indo-Arabic figures.

7. Adjustments—

The weights provided with loading holes shall be adjusted by the pouring the required weighed quantity of molten lead into the loading hole and pressing the lead firmly. The approximate distance of the lead from the surface shall not be less than 20 per cent of the minimum thickness of the weight when new.

SCHEDULE V
PART II—COMMERCIAL CARAT WEIGHTS

1. General—

(a) This part prescribed the requirements for commercial metric cast weights intended for use in weighing pearls, diamonds and other precision stones.

(b) For easy calculation and convenience in use, a cast is subdivided into 100 parts called cents. Thus, a cent equal 2 mg. Fractions of a carat are expressed with 100 as the denominator, the numerator representing the number of cents in the fraction; for example 0.5 carat is designed as 50/100 carat.

2. Denominations—

(a) The denominations of the carat weights shall be as given below:

(i) Knob Weights—Denomination
Carat

(c)
500
200
100
50
20
10
5

(ii) Sheet Metal Weights—Denomination
Carat

(c)
2
1
50/100
20/100

10/100
5/100
2/100
1/100
0.5/100

There will be two weights each of the denominations 2, 20 or 200 and 2/100, 20/100 carats.

3. Knob weights—

(a) Materials—The weight shall be made from rolled drawn or extended material and shall not cast.

The weights shall be made from brass, bronze, nickel-silver, non-magnetic nickel-chromium or non-magnetic stainless steel.

FIG. 9—Knob carat weight.

TABLE I—Nominal Dimensions of knob Carat Weights
(All dimensions in mm)

| Denomina- tion. | A | B | C | D | E | F | G | H | K |
|--------------------|----|-----|------|-----|-----|-----|------|-------|------|
| carat (c) | | | | | | | | | |
| 00 | 12 | 2.5 | 1.25 | 5.0 | 1.5 | 8.0 | 33.2 | 13.26 | 0.40 |
| 200 | 10 | 2.2 | 1.10 | 4.5 | 1.5 | 6.5 | 24.4 | 9.60 | 0.30 |
| 100 | 9 | 2.0 | 1.00 | 4.0 | 1.0 | 6.0 | 19.1 | 7.63 | 0.30 |
| 50 | 8 | 1.8 | 0.90 | 3.5 | 1.0 | 5.5 | 15.0 | 5.95 | 0.25 |
| 20 | 7 | 1.7 | 0.85 | 3.0 | 1.0 | 5.0 | 10.8 | 4.13 | 0.25 |
| 10 | 6 | 1.6 | 0.80 | 2.5 | 1.0 | 4.5 | 8.2 | 3.26 | 0.20 |
| 5 | 5 | 1.5 | 0.75 | 2.0 | 1.0 | 4.0 | 6.3 | 2.49 | 0.20 |

Note—The above nominal dimensions are related to a material with a density of 8.4 g/c m. To take into account variations in materials and manufacturing practices, a tolerance of +5 per cent is permitted on the dimensions except on C, E and K.

(b) Shape and Dimensions—The shape and dimensions of the weights shall be as shown in Fig. 9 and table 1.

(c) Permissible Errors—

| Denomination | Verification | Inspection | |
|--------------|--------------------------|--------------|------------|
| | Errors in excess only | Excess | Deficiency |
| Carat (c) | mg. | mg. | mg. |
| 500 | 8.0 | Same as on | 4.0 |
| 200 | 6.0 | Verification | 3.0 |
| 100 | 5.0 | | 2.5 |
| 50 | 4.0 | | 2.0 |
| 20 | 3.0 | | 1.5 |
| 10 | 2.0 | | 1.0 |
| 5 | 1.0 | | 0.5 |

4. Steel Metal Weights—

(a) Materials—Weights of denominations 2/100 carat and below shall be made of aluminium sheet. Weights of higher denominations shall be made of sheets of brass, aluminium, nickel-silver, nickel-chromium or bronze.

(b) Shape and Dimensions—Sheet metal weights shall be square with a raised corner for easy handling (see fig. 10), they shall have the dimensions given in table 2.

Fig. 10 sheet metal carat weight.

TABLE 2—Nominal dimensions of sheet metal carat weights

| Denomination (c) | Size |
|---------------------|---------------|
| Carat | mm |
| 2 | 12 |
| 1 | 10 |
| 50/100 | 9 |
| 20/100 | 8 |
| 10/100 | 7 |
| 5/100 | 6 |
| 2/100 | 5 |
| 1/100 | 4 |
| 0.5/100 | 3 |
| Tolerance | +10 per cent. |

(c) Permissible Errors—

| Denomination | Verification | Inspection | |
|--------------|-----------------------|--------------------------|------------|
| | errors in excess only | excess | deficiency |
| carat (c) | mg. | mg. | mg. |
| 2 | 0.8 | Same as on verification. | 0.4 |
| 1 | 0.6 | | 0.3 |
| 50/100 | 0.4 | | 0.2 |
| 20/100 | 0.2 | | 0.1 |
| 10/100 | 0.2 | | 0.1 |
| 5/100 | 0.1 | | 0.05 |
| 2/100 | 0.1 | | 0.05 |
| 1/100 | 0.1 | | 0.05 |
| 0.5/100 | 0.1 | | 0.05 |

5. Manufacture and Finish—

(a) The surface of the weights shall be reasonably smooth. Sheet metal weights shall be smoothly sheared and shall be free from burrs.

(b) For better stability and finish, the weights may be nickel-chromium, gold or rhodium-plated.

6. Marking—

(a) Every weight, except weights of 50 carat and lower denominations, shall have the manufacturers name or trade mark and the denomination indelibly stamped on it.

(i) The denomination shall marked in the Indo-Arabic numerals prefixed and suffixed by the letters “क” ‘c’ respectively, except that in the case of weights below 50 carat, only the numerals shall be marked. The size of the numerals and letters indicating denominations of weights shall be at least double the size of the letters indicating manufacturers’ name or trade mark.

(b) The markings shall be legible and deep enough to ensure indelibility over a long period of use, but not so deep as to crack the weight itself.

PART III—COMMERCIAL LIQUID CAPACITY MEASURES

1. General—

This part deals with two types of cylindrical liquid measures namely the dipping and the pouring types, and one type of conical measures.

2. Denominations—

The denominations of the different types of measures shall be as under:—

| Cylindrical Measures | | Conical measures |
|----------------------|--------------|------------------|
| Dipping type | Pouring type | |
| 1 litre | 2 litres | 20 litres |
| 500 ml. | 1 lit. | 10 lit. |
| 200 ml. | 500 ml. | 5 lit. |
| 100 ml. | 200 ml. | 2 lit. |
| 50 ml. | 100 ml. | 1 lit. |
| 20 ml. | 50 ml. | 500 ml. |
| | 20 ml. | 200 ml. |
| | | 100 ml. |

3. Shapes and dimensions—

(a) The shape and dimensions of cylindrical measures (dipping and pouring types) shall be as shown in Figs. 1(A) and 1(B) and Table 1.

Fig. 1 (A) Dipping Type cylindrical measure (schematic) Fig. 1 (B) pouring type cylindrical measures (Schematic)

TABLE 1—Nominal dimension of cylindrical capacity measures

| Denominations | D | M | B. max | min. | G min |
|---------------|------|-----|--------|------|-------|
| 2 litres. | 120 | 180 | 360 | 250 | 1.60 |
| 1 litres. | 95 | 142 | 254 | 210 | 1.60 |
| 500 ml. | 75 | 114 | 224 | 160 | 1.60 |
| 200 ml. | 55.5 | 83 | 166 | 120 | 1.25 |
| 100 ml. | 44 | 66 | 132 | 100 | 1.25 |
| 50 ml. | 35 | 52 | 104 | 80 | 1.25 |
| 20 ml. | 26 | 38 | 76 | 60 | 1.00 |

Note 1—all dimensions in millimetres.

Note 2—Tolerance on dimension +10 per cent.

(b) The shape and dimensions of conical measures shall be as shown in Fig. 2 and table 1.

Fig. 2—Pouring type conical measure (schematic)

TABLE 2—Nominal dimensions of conical capacity measures

| Denominations | | | | | | | | | | | |
|---------------|----|----|-----|-----|------|-----|-----|-------|----|------|-------|
| 20 litres | .. | 97 | 388 | 388 | 208 | 194 | 390 | 1.00 | 35 | 86 | 20 35 |
| 10 lit. | .. | 77 | 308 | 307 | 174 | 154 | 309 | 1.00 | 30 | 75 | 26 25 |
| 5 lit. | .. | 61 | 244 | 245 | 147 | 122 | 247 | 0.800 | 25 | 65.5 | 24 20 |
| 2 lit. | .. | 45 | 180 | 180 | 118 | 80 | 182 | 0.80 | 20 | 56 | 22 16 |
| 1 lit. | .. | 36 | 143 | 143 | 95.5 | 72 | 145 | 0.63 | 20 | 45 | 18 16 |
| 500 ml. | .. | 28 | 114 | 113 | 74 | 56 | 115 | 0.63 | 15 | 35 | 14 12 |
| 200 ml. | .. | 21 | 84 | 84 | 53 | 42 | 86 | 0.63 | 10 | 24.5 | 10 8 |
| 100 ml. | .. | 17 | 66 | 67 | 41 | 34 | 69 | 0.63 | 10 | 18.5 | 7 8 |

Note 1—All dimensions in millimetres.

Note 2—Tolerance on dimensions +10 per cent.

+ except in case of 10 litre and 20 litre measures for which the tolerance shall be +5 per cent.

4. Materials—

(a) Cylindrical Measures—The body of cylindrical measures shall be pressed from aluminium alloy sheets, brass sheets or stainless steel sheets. The minimum thickness of the sheets shall be as specified in Table 11.

(b) Conical Measures—The conical measures shall be fabricated from galvanised steel sheets, aluminium alloy sheets, copper sheets, brass sheets, stainless steel sheets or tin-plate, as may be specified by the purchaser. The minimum thickness of the sheets shall be as specified in Table 12.

(c) The handles for the measures shall be fabricated from the same material as that used for the body.

5. Manufacture and Finish—

(a) Measures made of brass sheets and copper sheets shall be well tinned or tin-plated uniformly all over the inside as well as the outside surface. Cylindrical measures made of brass sheets shall be well tinned or tin plated uniformly all over the inside as well as the outside surfaces conical measures made of brass sheets of copper sheets shall be well tinned or tinplated uniformly all over the inside when they are used for measuring commodities like milk, edible oils and such other food articles.

(b) The handles shall be of robust construction and shall be well formed and shaped generally as shown in Fig. 11 and Fig. 12. They shall be securely fixed to the body means of riveting, soldering or brazing.

(c) The measures shall be free from any surface defects and indentations and shall be smoothly finished at the top.

(d) Cylindrical measures shall be provided with a well formed and proportioned spout to facilitate pouring.

(e) Conical measures shall be provided with a retaining lip to avoid spilling. The retaining lip shall be provided with a brass plug with a collar to receive the lead for the Inspector’s seal. A small hole, about 5 mm in diameter, shall be provided at the bottom of the retaining lip to indicate the level to which the measure shall be filled and the hold shall be located on the side at right angle to the handle. The bottom of conical measures shall be suitably reinforced.

(f) The measures shall be so designed that, when they are tilted 120 degrees from the vertical, they shall become completely empty.

(g) The finished measures shall have adequate robustness for durability.

Note 1—Capacity measures when and for measuring milk shall have the handle fixed by welding, soldering or brazing so as not to leave pockets in which d’nt may accumulate.

Note 2—Dipping type cylindrical measures may also have handles substituted by two suitable but diagonally opposite brackets, affixed to the walls of the measures by means of soldering brazing or welding so as to hold the measure properly by a handle at right angles to the walls of the measure to facilitate its use in hot and boiled milk trade.

6. Permissible Errors—

| Denomination | Verification errors in excess only | | Inspection | | | |
|--------------|------------------------------------|------------------|----------------------|------------|------------------|------------|
| | Cylindrical measures | Conical Measures | Cylindrical measures | | Conical Measures | |
| | | | Excess | Deficiency | Excess | deficiency |
| | ml. | ml. | ml. | ml. | ml. | ml. |
| 20 l. | .. | 100 | Error | .. | Error | 50 |
| 10 | .. | 50 | same as | .. | same as | 25 |
| 5 | .. | 30 | in veri- | .. | in veri- | 15 |
| 2 | 30 | 15 | fication. | 15 | fication. | 7.5 |
| 1 | 20 | 10 | | 10 | | 5 |
| 500 ml. | 15 | 8 | | 7.5 | | 4 |
| 200 ml. | 8 | 4 | | 4 | | 2 |
| 100 ml. | 5 | 3 | | 2.5 | | 1.5 |
| 50 ml. | 3 | .. | | 1.5 | | .. |
| 20 ml. | 2 | .. | | 1 | | .. |

SCHEDULE V

PART IV—SPECIAL MEASURE FOR PETROLEUM PRODUCTS

1. General—

This part deals with a special capacity measure which may be used for petroleum products, in addition to the conical measures prescribed in part III of this schedule. This measure shall not be and for any other commodity.

2. Denominations—

The special measure shall have a capacity of 18.5 litres.

3. Shape and Dimensions—

The shape and dimensions of the special measure shall be as indicated in figure 1.

Fig. 1—18.5 litre measure for petroleum products.

4. Materials—

The measure shall be fabricated from galvanized steel sheets, aluminium alloy sheets, copper sheets, brass sheets, stainless steel sheets or tin plate. The minimum thickness of the sheet shall be as indicated in fig. The handle shall be fabricated from the same materials as that used for the body.

5. Permissible errors—

The maximum permissible error for verification as well as for inspection shall be as follows:

Verification—Excess only 100 ml.

Inspection—Excess 10 ml.

Deficiency 50 ml.

Figure 1. Special Measure of 18.5 litres for petroleum products.

7. Marking—

(a) Every cylindrical measure shall have the denomination and manufacturer's name or trade mark indelibly stamped on it. In the case of conical measures, the denomination and manufacturer's name or trade mark shall be either embossed on the body or indelibly marked on a name plate securely fixed to the body.

(b) The denomination shall consist of Indo-Arabic numerals and the abbreviation 'l' and 'ml' to indicate litre, and 'ml' and 'मिली' to indicate millilitre. The size of numerals and letters indicating denominations on the measures shall be twice the size of the letters indicating the manufacturer's name or trade mark.

PART V—DISPENSING MEASURES

1. General—

This part deals with two types of dispensing measures made of glass and transparent plastic materials used for dispensing purposes.

2. Types and Denominations—

Dispensing measures shall be of the following types and denominations:

(a) Conical measures: 200 ml, 100 ml, 50 ml, 20 ml, 10 ml and 5 ml.

(b) Beaker measures: 1000 ml and 500 ml

3. Materials—

(a) Glass measures—The measures shall be made of clear and transparent glass. They shall be well annealed; free from stones, cracks and chipping and as free as possible from olivets and other defects. Lead glass shall not be used for the measures.

(b) Transparent plastic Measures—The measures shall be made of a clear and transparent plastic material manufactured from polyvinyl chloride or copolymer, the major constituent of which is polyvinyl chloride. The plastic materials used shall not contain any constituents known to be injurious to health and likely to be extracted by contact with liquids.

4. Definition of capacity—The capacity corresponding to any graduation mark is defined as the volume of water at 27°C expressed in millilitres, required to fill the measure to that graduation mark at 27°C, the observer's eye being level with the front graduation mark and the lowest point of the water meniscus appearing to touch the top edge of that mark.

5. Conical Measures—

(a) Shape—The measures shall be conical as shown in fig. 1A to 1G, the 50 ml measures shall be either tall or squat as shown in Fig. 1C and 1D respectively.

Fig 1 A Fig 1 B Fig 1 C 50 ml. Fig 1 D 50 ml. Fig 1 E 200 ml. 200 ml. ('tall') ('squat') 20 ml.

Fig. 1 F Fig. 1 G Fig. 1 conical Measures. 10 ml. 5 ml.

(b) Construction—(i) Each measure shall have a pouring lip. The form of the lip shall be such that, when the measure is filled with water to the highest graduation mark, the contents may be poured from the lip in a stream falling clear of the outside of the measure

(ii) Each measure shall have a base on which it shall stand vertically without rocking when placed on a horizontal surface. The size of the base shall be such that the measure, when empty, shall not fall when placed on a plane inclined at 15° to the horizontal. The bottom of the measuring space, shall be uniformly rounded and shall merge smoothly into the side of the measure.

(iii) The wall thickness of the measures shall be sufficient to ensure sturdy construction and shall not show any local departures from uniformity.

(iv) The external surface of the measure shall be a cone having an included angle of not less than 13° and not more than 14°.

(v) The overall volume of the measure shall be such that when it is filled with water to the highest graduation mark and a volume of water equal to half its nominal capacity is added to it, there shall be no overflow. But, the addition of a further quantity of water equal to quarter the nominal capacity shall result in water overflowing from the pouring lip.

TABLE 1—Details of conical measures

| Denomi- nation | Graduated | Numbered | Back lines | Lowest gradua- tion mark | Height of lowest gradua- tion mark above bottom of measur- ing space | Mini- mum length of mark |
|-------------------|--|--|-----------------|-----------------------------------|--|--------------------------------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| ml. | ml. | ml. | ml. | ml. | ml. | ml. |
| 200 | 50, 100, 120, 140, 160, 180, 200. | 50, 100, 120, 140, 160, 180, 200. | 50, 100, 200 | 50 | 6.5±0.5 | 2.0 |
| 100 | Every 10 ml. from 10 to 100 ml. | 10, 20, 40, 60, 80, 100. | 20, 60, 100. | 10 | 3.0±0.5 | 1.75 |
| 50 | (tall.) Every 10 ml. from 10 to 50 ml. | 10, 30, 50 | 30, 50 | 10 | 4.0±0.5 | 1.5 |
| 50 | (Squat) Every 10 ml. from 10 to 50 ml. | 10, 30, 50 | 30, 50 | 10 | 3.0±0.5 | 1.5 |
| 20 | Every 5 ml. from 5 to 20 ml. | 5, 10, 20 | 10, 20 | 5 | 2.5±0.5 | 1.25 |
| 10 | Every ml. from 2 to 10 ml. | 2, 4, 6, 8, 10. | 2, 6, 10 | 2 | 2.5±0.5 | 1.0 |
| 5 | Every ml. from 1 to 5 ml. | 1, 3, 5 | 3, 5 | 1 | 2.5±0.5 | 0.75 |

(vi) With the pouring lip of measure facing to the right, the front graduation marks shall be placed at right angles, to, and on the right hand side of a vertical line extending from above the top graduation mark to near the base of the measure and below the bottom graduation mark.

(vii) The graduation marks shall be marked as shown in Fig. 1A to 1G. The marks shall be engraved or etched and they shall be of a uniform thickness not exceeding 0.3 mm, provided that they may taper slightly towards the ends. The graduation marks shall lie in planes perpendicular to the axis of the measure and shall be horizontal when the measure is standing on a horizontal surface.

(viii) Each graduation number shall be etched or engraved close to the end of the graduation mark to which it relates and in such a manner that it would be bisected by a prolongation of that graduation mark.

(ix) The numbered graduation marks shall have the maximum length specified in col. 7 of Table 1. The unnumbered graduation marks shall be at least two third the length of the numbered graduation marks and clearly shorter than the numbered marks.

(x) The height of the lowest graduation mark above the lowest point of the bottom of the measuring space shall be within the limits given in col. 6 of table 1.

(c) Permissible errors—

The permissible errors in capacity shall not exceed the figures given below (see Table 2). The permissible errors in excess or deficiency shall be the same for verification or inspection.

TABLE 2—Permissible errors in capacity of conical measures

| Capacity corresponding to graduation mark | Measures except 50 ml (squat) | 50 ml (squat) measures |
|---|-------------------------------|------------------------|
| 1 | 2 | 3 |
| ml. | | |
| 200, 180, 160 | 3.0 | .. |
| 140, 120, 100 | 2.00 | .. |
| 90, 80, 70, 60 | 1.5 | .. |
| 50, 40 | 1.0 | 1.0 |
| 30 | 0.8 | 1.0 |
| 20 | 0.6 | 0.8 |
| 15 | 0.5 | .. |
| 10, 9 | 0.4 | 0.6 |
| 8, 7, 6 | 0.3 | .. |
| 5 | 25 | .. |
| 4 | 20 | .. |
| 3 | 16 | .. |
| 2 | 12 | .. |
| 1 | 0.8 | .. |

Note—The permissible errors, apart from those of the 50 ml. (squat) measure, apply to graduation marks corresponding to the capacities stated, irrespective of the nominal capacity of the conical measure concerned.

6. Beaker Measures—

(a) *Shape*—The measures shall be in the form shown in Fig. 2A and 2B.

Fig. 14-A—1000 ml.

Fig. 14 B—500 ml.

Fig. 14—Beaker Measures

(b) *Construction*—(i) Each measure shall be provided with a pouring lip. The form of the lip shall be such that, when the measure is filled with water to highest graduation mark, the contents may be poured from the lip in a stream falling clear of the outside of the measure.

(ii) Each measure shall be provided with a base on which it shall stand vertically without rocking when placed on a horizontal surface. The size of the base shall be such that the measure, when empty, shall not when, placed on a plane inclined at 15° to the horizontal. The bottom of the measuring space shall be uniformly rounded and shall merge smoothly into the sides of the measure.

(iii) The overall volume of the measure shall be such that when the measure is filled with water to the highest graduation mark and a volume of water equal to quarter the denomination volume is added to it, the water shall not overflow.

(c) *Graduation*—(i) The graduation marks shall be marked as shown in Fig. 14A and 14B and table 15. The marks shall be etched or engraved and shall be of a uniform thickness not exceeding 0.3 mm, provided that they may taper slightly towards the ends. The graduation marks shall lie in planes perpendicular to the axis of the measure and shall be horizontal when the measure is standing on a horizontal surface.

(ii) Each graduation number shall be etched or engraved close to the end of the graduation mark to which it relates and in such manner that it would be dissected by a prolongation of that graduation marks.

(iii) The distance between the highest and the lowest graduation marks and the height of the lowest graduation mark above the inside of the base of the measure shall be in accordance with col. (3) and (4) respectively of Table 3.

TABLE 3—Graduation and dimensions of beaker measures

| Denomination | Graduation at | Distance between lowest & highest graduation marks | Height of lowest graduation mark above bottom of measuring of surface | Diameter of top | Minimum diameter of base | Overall Height |
|--------------|---|--|---|-----------------|--------------------------|----------------|
| 1 | 2 | 3 | 4 | 5* | 6* | 7* |
| ml. | | cm. | cm. | cm. | cm. | cm. |
| 1000 | 200 to 1000 ml. at each 100 ml; numbered at each 200 ml; unnumbered back lines at 200, 600 and 1000 ml. | 11±1 | 4±1 | 12 | 9 | 23 |
| 500 | 100 to 500 ml. at each 50 ml. numbered at each 100 ml. unnumbered back lines at 100, 300 and 500 | 9±0.5 | 3±0.5 | 10 | 8 | 13 |

*These are only recommendatory.

(d) *Permissible Errors*—The permissible errors in excess or in deficiency for verification or inspection shall not exceed 7 ml. for 1000 ml. measures and 5 ml. for 500 ml. measure.

7. *Marking*—Each measure shall have permanently and legibly engraved or etched on it its denomination in Indo-Arabic numerals the abbreviations 'ml' and मिली being used to indicate millilitres. The manufacturer's name or trade mark shall be marked on the under-side of the base of each measure.

PART VI—COMMERCIAL LENGTH MEASURES (Non-Flexible)

1. General—

This part deals with the non-flexible type of commercial length measures made of metal or wood.

2. Denominations—

The denominations of the length measures shall be as follows:—

Metallic measure

1 m.
0.5 m.

Wooden measures

1 m.
2 m.
0.5 m.

3. Metallic Measures

(a) *Materials*—The measures shall be made from mild steel or brass plated with nickel and chromium or from stainless steel.

(b) *Shape and Dimensions*—The shape and dimensions of the measures shall be as shown in Fig. 15.

Fig. 15—Metallic

(c) *Graduation*—(i) The graduation marks shall be made at every centimetre for the first ten centimetres and thereafter at every five centimetres. The graduation marks at every ten centimetres shall be numbered. The marks at the centimetre divisions shall extend over half the breadth and those at five centimetres divisions over full breadth of the measures. A cross mark shall be provided at 25 centimetres in the case of 0.5 m. measure and at 25, 50 and 75 cm. in the case of 1 m. measure (see Fig. 1).

(ii) The graduations shall be only on one side of the measure.

(d) *Permissible Errors*—The mark at every five centimetres shall not exceed or be deficient by more than 0.25 mm, and further the errors from the beginning of the measure to any line mark shall not exceed 1.0 mm, always provided that the errors on the full length of the measure shall not exceed the following limits.

| Denomination | Verification | | Inspection | |
|--------------|--------------|------------|------------|------------|
| | Excess | Deficiency | Excess | Deficiency |
| 1 m | 1.0 mm | 0.5 mm | 1.0 mm | 1.0 mm |
| 0.5 m | 0.5 mm | 0.25 mm | 0.5 mm | 0.5 mm |
| | 2 | 1 | 2 | 2 |
| | 1 | 0.5 | 1 | 1 |

(e) *Provision for stamping*—The measures shall be provided with a copper rivet near each end (see Fig. 1), firmly fixed in a hole, countersunk on both sides, for the inspector's stamp. An arrow head shall be marked at each end of the measure to provide the points for checking the length.

4. *Wooden Measures*—

(a) *Materials*—The measure shall be made from well seasoned timber of any one of the following species:

- teak (*Tectona grandis* Linn. f.)
- rosewood (*Dalbergia latifolia* Roxb.)
- Shisham (*Dalbergia sissoo* Roxb.)
- Haldu (*Adhina cordifolia* Hock f.)
- bijasal (*pterocarpus marsupium* Roxb.)
- Boxwood (*buxus sempervirens*)
- beech (*Eagus silvatica*)

(b) *Shape and Dimensions*—The shape and dimensions of the measures shall be as shown in Fig. 2.

Fig. 16—Wooden Measure

(c) *Graduation*—The graduation marks shall be made at every centimetre for the first ten centimetres and therefore, at every five centimetres. The graduation marks at every ten centimetres shall be numbered. The marks at the centimetre divisions shall extend over half the breadth and these at the five centimetre divisions over the full breadth of the measures. A cross mark shall be provided at every 25 cm, excluding the one metre and two metre graduations (see Fig. 16).

The graduations shall be on one side of the measures only.

(d) *Permissible Errors*—The mark at every five centimetres shall not exceed or be deficient by more than 1 mm, and further the error from the beginning of the measure and line mark shall not exceed 2 mm, always provided that the errors on the full length of the measure shall not exceed the following limits.

| Denomination | Verification | | Inspection | |
|--------------|--------------|------------|------------|------------|
| | Excess | Deficiency | Excess | Deficiency |
| 2 mm | 4 mm | 2 mm | 4 mm | 4 mm |
| 1 | 2 | 1 | 2 | 2 |
| 0.5 | 1 | 0.5 | 1 | 1 |

(e) *Provision for stamping*—Each measure shall be provided at each end with a metal tip not less than 1 cm in width, securely riveted with two rivets at each end, as shown in Fig. 16, for receiving the Inspector's stamp. The width of the tips shall be included in the total length of the measure.

5. *Manufacture and Finish*—

(a) The measure shall be evenly finished and shall be reasonably straight.

(b) In the case of metallic measures, the graduation marks and the cross marks shall be legible and deep enough to ensure indelibility over a reasonably long period of use, but not so deep as to make the measures liable to be easily bent. In the case of wooden measures, the markings shall be finished neatly, sharply and legibly, in a colour contrasting with the wood finish. They shall be visible from a distance and shall remain indelible over a reasonably long period of use.

6. *Markings*—

(i) The denomination shall be stamped, on the un-graduated side of the measure at about one third of the total length from the beginning of the measure and the manufacturer's name or trade mark at similar distance from the end of the measure. In the case of wooden measures, the markings shall be finished in the same manner as the graduation.

(ii) The denomination shall be given in Indo-Arabic numerals preceded by the word 'मीटर' and succeeded by the word 'metre'. The size of numerals and letters, indicating denominations of the measures, shall be twice that of the letters indicating the manufacturer's name or trade mark.

SCHEDULE V

PART VII—Woven metallic tape measures

1 Woven metallic tape measures may be used where the use of rigid measures is not convenient or practicable.

2. *Denominations*—

The tape measures shall be made in lengths of 2, 5, 10, 15, 20, 30, or 50 metres.

3. *Tape*—

(a) *Materials*—(i) The tape shall be of yarn and metal wire in the warp and only yarn in the weft.

(ii) The yarn shall be spun from good quality cotton or linen and shall be either bleached or mercerized. The yarn used shall be of 20 count, (30/2 tex) in the warp and 40 count (15/2 tex) in the weft.

(iii) The wire shall be of phosphor bronze, copper or stainless steel shall be 0.16 mm in diameter.

(b) *Weave*—(i) The weave shall be either, plain, that is one up and one down, or dovati, that is two up and two down, with at least eight wires uniformly spaced in the warp.

(ii) The total number of warp threads, including wire threads, shall be in the full width of the tape. The picks per centimetre shall be 10 in the case of cotton yarn and 13 in the case of linen yarn.

4. *Manufacture*—

(a) The tape shall be coated with a suitable primer of synthetic material over which one or more coats of a flexible, high quality enamel shall be given. The final top coat shall be of a varnish which shall give the tape a good finish. All coatings shall be non-cracking and water resistant.

(b) A metal ring shall be attached to the outer end of tapes of denominations 10, 15, 20, 30 and 50 metres, the ring being fastened to the tape by a metal strip of the same width as the tape for protection and for receiving the Inspector's stamp (see Fig. 1).

(c) (i) The outer end of tapes of denominations 10, 15, 20, 30 and 50 metres shall be reinforced over a length of not less than 10 cm by a strip of leather or suitable plastic material of the same width as the tape. The leather or plastic strip shall also pass around the ring and under the metal strip. (see Fig. 1).

(ii) Tapes of 2 and 5 metre denominations shall be reinforced over a length of not less than 10 cm by a strip of cotton fabric or suitable plastic material, over which a strip of brass or any other suitable material is rigidly fixed for protection and for receiving the Inspector's stamp (see Fig. 2).

Fig. 1—Woven metallic tape measure 10, 15, 20 and 30 metres.

5. *Graduations*—

(a) The length of the tape shall include the metal finger ring, when provided.

(b) At every centimetre a black line, 8 to 10 mm in height shall be drawn and every five centimetres shall be marked with an arrow in black. Every 10th cm and every metre shall be marked with a black line extending over the full width of the tape (i.e. 16 mm). The graduation marks at every 10th cm and every metre shall be numbered with black and red figures, respectively. The metre markings shall, in addition, contain the letters 'मी' and 'm' and the end of the tape shall be marked 'मीटर' and 'metre'. The graduations shall be only on one side of the tapes.

(c) *Permissible errors*—The errors in the length of the tape when supported on a horizontal surface, under a tension of one kilogram, shall not exceed the following both during verification and inspection:

| Denomination | Permissible errors | | | | |
|--------------|--------------------|----|----|----|----------|
| m | | | | | |
| 2 | .. | .. | .. | .. | ±1.5 mm |
| 5 | .. | .. | .. | .. | ±3.0 mm |
| 10 | .. | .. | .. | .. | ±5.0 mm |
| 15 | .. | .. | .. | .. | ±7.5 mm |
| 20 | .. | .. | .. | .. | ±10.0 mm |
| 30 | .. | .. | .. | .. | ±15.0 mm |
| 50 | .. | .. | .. | .. | ±20.0 mm |

In addition, in the case of 20, 30 and 50 metre tapes, the errors from the beginning of the tape to the lengths specified below shall not exceed the following limits:

| Length | Permissible errors | | | | |
|--------|--------------------|----|----|----|-------|
| M | | | | | mm |
| 10 | .. | .. | .. | .. | ±10 |
| 15 | .. | .. | .. | .. | ±12.5 |
| 20 | .. | .. | .. | .. | ±15 |
| 30 | .. | .. | .. | .. | ±20 |

6. *Marking*—

On the ungraduated side and also on the case of each tape when provided, the name of the manufacturer or his registered trade mark and the denomination shall be legibly marked in English or Devnagri or in both.

7. *Provision for Stamping*—

Measures shall be stamped on the metal strip at the beginning of the scale on the graduated side.

SCHEDULE V

PART VIII—STEEL TAPE MEASURES (WINDING TYPE)

1. Denominations—

The denominations of the tape measures shall be 1, 2, 10, 15, 20, 30 and 50 metres.

2. Tape—

(a) Tapes shall be of steel or stainless steel and may be of the following dimensions:

| Width | Tolerance | Corresponding thickness | Tolerances |
|-------|-----------|-------------------------|------------|
| mm | mm | mm | mm |
| 16.0 | ±0.5 | 0.40 | ±0.05 |
| 13.0 | | 0.40 | |
| 9.5 | | 0.40 | |
| 6.0 | | 0.15 | |

(b) The tape shall be of such a quality that when it is wound once round a rod of the diameter indicated below and then released, there shall be no permanent deformation in the tape.

| Thickness of tape | Diameter of Rod |
|-------------------|-----------------|
| mm | mm |
| 0.15 | 12 |
| 0.40 | 25 |

(c) The tapes of widths 16.0, 13.0 and 9.5 mm shall be curved or flat. Tapes of 6.0 mm width shall be flat.

(d) The edges of the tapes shall be slightly rounded. The tapes shall be well-polished or provided with a rust-proof coating and shall be free from burrs.

(e) The outer end of the tapes shall be provided with a ring or other device for facilitating withdrawal. The ring or other device shall be fastened to the tape by a metal strip of the same width as the tape.

3. Graduations—

(a) The length of the tape shall include the metal finger ring, when provided.

(b) The tape shall be graduated at intervals of 1 mm along the first 10 cm of its length, and at intervals of 5 mm, over the remaining part. The height of the graduation marks shall be as follows:—

| Unit | Minimum height of marking |
|--------------------------|---------------------------|
| | mm |
| Millimetre | 2 |
| Five millimetres | 3 |
| Centimetre | 4 |
| Metre | Full width of the tape |

(c) Every 10 cm and metre shall be marked with Indo-Arabic numerals in bold type. The metre divisions shall, in addition, bear the designation 'मी' and 'm'. Every centimetre in the first 10th cm shall also be marked with Indo-Arabic numerals. The end of tape measures of denominations 10, 15, 20, 30 and 50 metres shall be marked with the words 'मीटर' and 'metre' (see Fig. 1).

Fig. 1 steel tape measures—10, 15, 20, 30 and 50 metres Fig. 1—20 metre chain.

4. Permissible errors—

(a) When checked against a working standard, the error in the length of the tape, supported on a horizontal surface with a tension of 2 kg. in the case of 1 and 2 metre lengths and 5 kg in the case of 10, 15, 20, 30 and 50 metre lengths, shall not exceed the following limits:

(i) The error between any two adjacent millimetres lines on between consecutive centimetre lines shall not exceed ± 0.2 mm. The error between consecutive 10th cm lines or consecutive metre lines shall not exceed ± 0.4 mm, and

(ii) When measured from zero to the points specified below, the error in the length of the tape shall not exceed the following limits:

| | |
|---|---|
| (i) 1 metre mark | ±0.4 mm |
| (ii) 2 metre mark | ±0.6 mm |
| (iii) 5 metre mark | ±1.0 mm |
| (iv) Any metre mark beyond the first 5 metres | (1.0 mm for the first 5 metres ±0.5 mm for each additional 5 metres of part thereof). |

(b) The permissible errors are the same for verification or inspection.

5. Marking—

On the ungraduated side and on the case of each tape, the name or trade mark of the manufacturer and the denomination shall be legibly marked in English or Devanagari or in both. In addition, the direction of winding shall also be legibly marked on the case.

6. Provision for stamping—

Measures shall be stamped near the beginning of the scale on the graduated side.

SCHEDULE V

PART IX—SURVEYING CHAINS

1. General—

This part prescribes the requirements for link type surveying chains of 20 m and 30 m length for land measurement.

2. Definitions—

(a) *Surveying chain*—An instrument for measuring the surface distance between two points.

(b) *Length of chain*—The distance between the outside surface of the handles when fully stretched.

(c) *Tallies*—Metallic tags or indicators of distinctive pattern fixed at various points of the chain, to facilitate quick reading of fractions of a chain.

3. Material—

The different components of the chains shall be made from the materials mentioned against each:

| Component | Material |
|---|---|
| Handle | Brass castings. |
| Eye Bolt Collar | Brass -suitable for free cutting and high speed machine work. |
| Ring link, small link, large link, connecting | Galvanized Mild steel wire 4.00 mm. |
| Tally | Brass sheet or galvanized sheet. |
| Indicating Ring | Brass wire. |

4. Constructional details—

(a) The nomenclature of the different parts of the chain and their dimension shall be as indicated in Figs. 1, 2, and 3.

(b) Tallies shall be fixed at every fifth metre along the chain. Small rings shall be fixed at every metre, except where tallies are attached. The tallies shall have distinctive shapes depending on their position in the chain as shown in Figs. 1 and 2.

(c) Connecting links between two large links shall be oval in shape, the central one being a circular ring.

(d) To facilitate holding the arrows (chain pins) in position with the handle of the chain, a groove shall be cut on the outside surface of the handle as shown in Fig. 3. The radius of the groove shall correspond to the radius of the arrows.

(e) The handle joint shall have flexibility in order that it may be possible to swivel the handle round the eye bolt. A swivel may also be provided at the middle of the chain.

5. Permissible errors—

(a) When measured with a tension of 8 k.g. every metre length shall be accurate with an error not exceeding ± 2 mm. The overall length of the chains shall be accurate within the following limits of error.

20 metre chain ± 5 mm.

30 metre chains ± 8 mm.

(b) The permissible errors shall be the same for verification and inspection.

6. Marking—

(a) The tallies used for marking the distances in a chain shall be marked with letters 'मी' and 'm' (see Fig. 3).

(b) The length of the chain, 20 m or 30 m, as the case may be, shall be indelibly marked over the handle (see Fig. 3) to indicate the length.

(c) The chains shall be indelibly marked, on the reverse side of the surface of the handle having the denominations, with the manufacturer's name, or trade mark.

7. *Provision for Stamping—*

A metal label or disc shall be permanently attached to the handle at the beginning of each chain for the Inspector's stamp.

SCHEDULE VI

(see rule 10)

Specifications for Commercial Weighing Instruments

PART I—GENERAL REQUIREMENTS

1. Weighing instruments of the following categories are included in these specifications:—

- (a) Beam scales.
- (b) Counter machines.
- (c) Steel-yards.
- (d) Platform weighing machines.
- (e) Weighbridges.
- (f) Spring balances.
- (g) Crane weighing machines.
- (h) Automatic weighing machines.
- (i) Self-indicating and semi-self indicating counter Type machines.
- (j) Person weighing machines.

2. (a) Weighing instruments shall be of such materials, design and construction that, under normal conditions of service.

- (i) They maintain accuracy.
- (ii) They function satisfactorily without the need for frequent adjustments.
- (iii) Excessive stresses do not develop in the vital parts.

(b) All weighing instruments having steelyards shall be of, what is commonly known, as, the vibrating type.

(c) A vibrating type of instrument is an instrument which has its indicator oscillating on either side of the position of equilibrium.

(d) Weighing instruments shall be of good workmanship and finish.

(e) Weighing instruments having assembly parts, without which the accuracy of the instrument is affected, shall be so constructed that it is not possible to use the instrument without these parts. They shall be suitably identified with the weighing instrument of which they form essential components.

(f) Where an instrument has interchangeable or reversible parts, the interchange or reversal of such parts shall not affect the accuracy of the instrument.

(g) All graduations in weighing instruments shall consist of notches or uniform lines, sharply defined, which may be painted, printed, incised or embossed, so that the position of all pointers or sliding poises is clearly readable. All numbered graduations and their subdivisions shall be marked by lines longer than the minor graduations. The minimum width apart of graduations on steelyards shall be not less than 1.5 mm of capacities below 3000 kg and 3 mm for capacities of 3,000 kg and above.

(h) *Knife-edges and bearings*—The knife-edges and bearings shall be agate or suitable hard material or of suitable quality steel. The steel knife-edges and bearings shall have the hardness specified below:—

- (i) for beam scales of classes C and D and with capacities 10 kg. and below—54 rc. minimum.

- (ii) For other weighing instruments—60 to 66 rc.

(i) The knife-edges and bearings shall be replaceable wherever practicable.

(j) Knife-edges and bearings shall be accurately and firmly secured preferably by shanks and nuts, or by bolts and nuts or by set screws. The knife-edges and bearings shall be protected against corrosion and dirt.

(k) Racks and pinions shall be of suitable hardwearing material and shall be finished smooth.

(l) In the case of weighing instruments having steelyards, the nib shall remain secure in the notch.

(m) The knife-edges shall bear upon practically the whole length of the bearings.

3. *Marking—*

(a) All weighing machines shall be prominently, legibly and indelibly marked with the maker's name or his registered trade mark, model, capacity and class (wherever applicable).

Note—The manufacturer's name or the registered trade mark shall be such as will not be mistaken for the stamp or the seal of the verification authority.

(b) Weighing instruments shall have inscribed on them their maximum weighing capacity in the following manner:—

'Two weigh..... t, kg, or g' as appropriate.....
दुन किलो या ग्राम के लिये as appropriate.

(c) All numerals appearing on weighing instruments—beams, steel yards, dials, etc.—shall be Indo-Arabic numerals.

4. *Sealing—*

All weighing instruments shall be provided by the manufacturer with a plug or stud or soft metal to receive the stamp or seal of the verification authority. Such plug or stud shall be provided in a conspicuous part of the instrument and shall be made in such a manner as to prevent its removal without obliterating the seal.

5. *Tests—*

(a) All weighing instruments shall be tested after they have been properly cleaned, and in the condition of their normal use, wherever practicable. Non-portable weighing instruments shall be tested *in situ* in addition to any other test that may be conducted at the premises of the manufacturer or dealer.

(b) *Sensitiveness*—is the least weight which when added to or removed from the loading platform or pan when the machine is in equilibrium, will cause an appreciable movement of the indicator from its position of equilibrium.

Error—is the least weight, which when added or removed will bring the indicator to the position of poise or equilibrium from its position of imbalance.

(c) Weighing instruments shall be tested for sensitiveness and maximum error.

(i) The greatest error in excess on verification for graduations on the steelyard in the range corresponding to the first half of the capacity shall be not more than half the error allowed at full load; for graduations on the remaining part of the steelyard, the error shall be not more than the error prescribed at full load.

(ii) The greatest error in excess on verification in the case of machines fitted with dial shall be half the weight represented by the interval between the consecutive graduation marks.

(iii) The permissible error in respect of graduations on machines fitted both with steelyard/s and dial shall be as prescribed above in (i) and (ii).

SCHEDULE VI

PART II—BEAM SCALES

1. *Definitions—*

(a) A beam scale may be defined as a weighing instrument with equal arms, having three knife-edges, three bearings, an indicator (pointer) in the centre, and pans suspended from the end knife-edges (see Fig. 1).

(b) *Sensitivity*—is the ratio between 'change in mass' in one pan of the balance and the corresponding deflection of the beam or of the attached pointer produced by this change. Sensitivity may, therefore, be express as mg. per division.

(c) *Sensitiveness*—is the least weight which when added to or removed from the loading pan causes an appreciable movement of the indicator from its position of equilibrium.

(d) *Greatest Error 'due to Inequality of Arms'*—(i) The greatest error is the weight required to bring the scale to equipoise with weights of equal mass placed on the two pans.

Fig. 1 Beam scale.

Fig. 2 Agate Box.

Fig. 3 Dutch end.

Fig. 4 Seven neck.

Fig. 5 Continuous knife edge.

Fig. 6 Beam class B (flat type)

Fig. 7 Beam class B (open pattern type).

Fig. 8 Beam class C (Swan neck with separate flat hooks)

Fig 9 beam class C (dutch end type)

Fig. 10 Beam class D (Swan neck with fixed flat hooks)

2. Classes—

- (a) Beam scales may be of four classes A, B, C, and D depending on sensitivity or sensitiveness and greatest error specified in tables 1, 2, 3, 4 respectively.
- (b) The trades for which the different classes of scales may be used are:

| Class of scale | Use |
|----------------|--|
| A | Assay. |
| B | Precious stones, jewels, pearls, bullion, precious metals, saffron and similar expensive commodities, chemists and druggists preparations, perfumery, etc. |
| C | Base metals and commodities such as cereals, Tea, coffee, tobacco, jute, cotton, dry fruits, spices, oil-seeds, etc. |
| D | Weighment of cheaper commodities such as scrap iron, fuel, wood, charcoal, vegetables, etc. |

3. Capacities—

Beam scales of the different classes may be of the capacities shown in table 1, 2, 3 and 4.

4. Materials—

- (a) *Material for Class A Beam Scales*—Class A beam scales shall be made of non-magnetic materials only.
- (b) *Materials for other classes of Beam scales*—(i) Beams shall be made of stainless steel, mild steel, brass, bronze or aluminium alloy.
- (ii) Pans shall be made of stainless steel, mild steel, brass or hornze. The pans of class B beam scales may also be made of glass. In the case of beam scales of classes C and D, pans of hardwood shall be permitted, for capacities 100 kg and above. The pans of beam scales, when made of timber, shall be adequately reinforced with metallic plates and bands duly secured by bolts and nuts.
- (iii) *Suspension*—Pans shall be suspended from the beam by metal chains or metal stirrups; silk or nylon thread may also be used for class B scales of capacity 100 kg and below.
- (iv) All mild steel parts used in beam scales shall be suitably protected against rust.

5. Beam Fittings—

- (a) The knife-edges and bearings used in beam scales shall be of one of the following types
- (i) 'Agate-box'—wherein agate beatings are fitted in a brass or iron box, with side holes which permit the projecting ends of the knife-edges to pass into the boxes and rest on or rise to their bearings (See Fig. 2).
- (ii) 'Dutch-end'—wherein the end bearings are fixed inside plates bolted together across the beam to form a shackle (see Fig. 3).
- (iii) 'Swan-neck'—wherein the ends are curved and slotted, the bottom of the slot forming a knife-edge the extremities of the beam being widened in a direction at right angle to its length so that the base of the slot is parallel to the central knife-edge (see Fig. 4).
- (iv) 'Continuous knife-edge'—where the knife edges rest on the bearings along their whole length (see Fig. 5).

6. Construction—

- (a) Class A beam scales shall be provided with means for relieving the bearings and knife-edges.
- (b) Every beam scales of class A shall be provided with a glass case. It shall also be provided with bubbles or a plumb line and levelling screws to facilitate levelling of the instrument.
- (c) Beam scales of classes B, C and D shall have the leading dimensions specified in Tables 5 to 9, and Fig. 6 to 10 as applicable.
- (d) Class D beam scales shall be distinguished from Class C scales by two holes of the same size (5 to 10 mm in diameter) through the beam, one on either side of the central knife edge (see Fig. 10).
- (e) The dimensions may vary within plus or minus 10 per cent of those prescribed in the Tables 5 to 9.
- (f) Beam scales of classes B, C and D and capacities 50 kg and above shall be provided with balance balls or balance boxes. The balance ball or balance box shall be securely attached to one of the suspension chains or pans in such a manner that it is not possible to tamper with it easily. The balance ball or balance box shall not be so large as to contain loose material of weight exceeding 1 per cent of the capacity for scales of capacity 50 kg. or exceeding 1 kg. for scales of higher capacity.
- (g) Beam scales other than of class A shall not be provided with an attachment of adjust their sensitivity.

7. Tests—

- (a) *Sensitiveness*—The scales shall be tested for sensitiveness at full load and shall comply with the requirement specified in tables 1 to 4.
- (b) *Inequality of Arms Test*—(i) In the case of beam with fixed hooks, the beam with hooks but without chains and pans shall be brought to a position of equilibrium. If there are detachable hooks, the beam without the hooks shall be brought to equilibrium. Later the hooks may be attached and the beam again brought to equilibrium. The beam with hooks, chain and pans is then brought to a position of equilibrium. It shall then be loaded with weights in both pans equal to the capacity of the scale and balanced. Where there is an attached hook, the chain with the loads in them shall be interchanged and extra weight added to one of the pans to balance the beam.

In the case of beams with detachable hooks the hooks, chains and pans together with the load thereon shall be interchanged and the extra weight required, to, balance the beam noted. Half this extra weight shall not exceed the limits specified in Tables 1 to 4.

8. Sealing—

All beams scales shall be provided with a plug or plugs or stud or studs of soft metal to receive the stamp or seal of the verification authority. Such plug or plugs or stud or studs shall be provided in a conspicuous part of the scale and shall be made in such a manner as to prevent its removal without obliterating the seal or seals.

TABLE 1—Limits for sensitiveness and greatest errors for beam scales Class 'A'

| Capacity | Verification | | Inspection | |
|----------|-------------------------------------|--|-------------------------------------|--|
| | Sensitiveness per division of scale | Greatest error allowed when fully loaded | Sensitiveness per division of scale | Greatest error allowed when fully loaded |
| 1 | 2 | 3 | 4 | 5 |
| 2 g | 0.02 mg | 0.1 mg | 0.08 mg | 0.2 mg |
| 10 g | 0.05 mg | 0.2 mg | 0.15 mg | 0.4 mg |
| 20 g | 0.10 mg | 0.5 mg | 0.30 mg | 1.0 mg |
| 50 g | 0.20 mg | 1.0 mg | 0.60 mg | 2.0 mg |
| 200 g | 0.50 mg | 2.0 mg | 1.50 mg | 4.0 mg |
| 1 kg | 5.0 mg | 20.0 mg | 1.50 mg | 40.0 mg |
| 5 kg | 10.0 mg | 40.0 mg | 30.0 mg | 80.0 mg |
| 20 kg | 20.0 mg | 80.0 mg | 60.0 mg | 160.0 mg |
| 50 kg | 60.0 mg | 100.0 mg | 150.0 mg | 200.0 mg |

TABLE 2—Limits for sensitiveness and greatest errors for beam scales Class 'B'

| Capacity | Verification | | Inspection | |
|----------|---------------------------------|--|---------------------------------|--|
| | Sensitiveness when fully loaded | Greatest error allowed when fully loaded | Sensitiveness when fully loaded | Greatest error allowed when fully loaded |
| 1 | 2 | 3 | 4 | 5 |
| 2 g | 0.2 mg | 0.4 mg | 0.60 mg | 0.8 mg. |
| 5 g | 0.5 mg | 1.0 mg | 1.5 mg | 2.0 mg |
| 10 g | 1.0 mg | 2.0 mg | 3.0 mg | 4.0 mg |
| 20 g | 2.0 mg | 4.0 mg | 6.0 mg | 8.0 mg |
| 50 g | 5.0 mg | 10.0 mg | 15.0 mg | 20.0 mg |
| 100 g | 10.0 mg | 20.0 mg | 30.0 mg | 40.0 mg |
| 200 g | 20.0 mg | 40.0 mg | 60.0 mg | 80.0 mg |
| 500 g | 50.0 mg | 100.0 mg | 150.0 mg | 200.0 mg |
| 1 kg | 100.0 mg | 200.0 mg | 300.0 mg | 400.0 mg |
| 2 kg | 100.0 mg | 200.0 mg | 300.0 mg | 400.0 mg |
| 10 kg | 250.0 mg | 500.0 mg | 750.0 mg | 1.0 g |
| 10 kg | 500.0 mg | 1.0 g | 1.5 g | 2.0 g |
| 20 kg | 1.0 g | 2.0 g | 3.0 g | 4.0 g |
| 50 kg | 2.5 g | 5.0 g | 7.5 g | 10.0 g |
| 100 kg | 5.0 g | 10.0 g | 15.0 g | 20.0 g |
| 200 kg | 10.0 g | 20.0 g | 30.0 g | 40.0 g |

TABLE 3—Limits of sensitiveness and greatest errors for beam scales Class 'C'

| Capacity | Verification | | Inspection | |
|----------|---------------------------------|--|---------------------------------|--|
| | Sensitiveness when fully loaded | Greatest error allowed when fully loaded | Sensitiveness when fully loaded | Greatest error allowed when fully loaded |
| 1 | 2 | 3 | 4 | 5 |
| 100 g | 100 mg | 200 mg | 300 mg | 400 mg |
| 200 g | 200 mg | 400 mg | 600 mg | 800 mg |
| 500 g | 500 mg | 1.0 g | 1.0 g | 2.0 g |
| 1 kg | 1.0 g | 2.0 g | 3.0 g | 4.0 g |
| 2 kg | 1.0 g | 2.0 g | 3.0 g | 4.0 g |
| 5 kg | 2.5 g | 5.0 g | 7.0 g | 10.0 g |
| 10 kg | 5.0 g | 10.0 g | 15.0 g | 20.0 g |
| 20 kg | 10.0 g | 20.0 g | 30.0 g | 40.0 g |
| 50 kg | 12.5 g | 25.0 g | 37.5 g | 50.0 g |
| 100 kg | 25.0 g | 50.0 g | 75.0 g | 100.0 g |
| 200 kg | 25.0 g | 50.0 g | 75.0 g | 100.0 g |
| 300 kg | 37.5 g | 75.0 g | 112.5 g | 150.0 g |
| 500 kg | 62.5 g | 125.0 g | 187.5 g | 250.0 g |
| 1000 kg | 125.0 g | 250.0 g | 375.0 g | 500.0 g |

TABLE 4—Limits for sensitiveness and greatest errors for beam scales
Class 'D'

| Capacity | Verification | | Inspection | |
|----------|---------------------------------|--|---------------------------------|--|
| | Sensitiveness when fully loaded | Greatest error allowed when fully loaded | Sensitiveness when fully loaded | Greatest error allowed when fully loaded |
| 1 | 2 | 3 | 4 | 5 |
| 1 kg | 2.0 g | 3.0 g | 6.0 g | 6.0 g |
| 2 kg | 2.0 g | 3.0 g | 6.0 g | 6.0 g |
| 5 kg | 5.0 g | 7.5 g | 15.0 g | 15.0 g |
| 10 kg | 10.0 g | 15.0 g | 30.0 g | 30.0 g |
| 20 kg | 20.0 g | 30.0 g | 60.0 g | 60.0 g |
| 50 kg | 25.0 g | 37.5 g | 75.0 g | 75.0 g |
| 100 kg | 50.0 g | 75.0 g | 150.0 g | 150.0 g |
| 200 kg | 50.0 g | 75.0 g | 150.0 g | 180.0 g |
| 300 kg | 75.0 g | 150.0 g | 225.0 g | 300.0 g |
| 500 kg | 125.0 g | 250.0 g | 375.0 g | 500.0 g |
| 1000 kg | 250.0 g | 500.0 g | 750.0 g | 1000.0 g |

TABLE 5—Leading dimensions of beam for beam scales, Class 'B'
(with pointer above the beam)

| Capacity | Length between the ends (nominal) L—mm | Depth at the centre (nominal) D—mm | Thickness of plate at the centre (Nominal) T—mm |
|----------|--|------------------------------------|---|
|----------|--|------------------------------------|---|

(a) Flat Type with Pointer above Beam

| | | | |
|--------|------|-----|------|
| 2 g | 70 | 3 | 2 |
| 5 g | 95 | 3 | 2 |
| 10 g | 110 | 4 | 2 |
| 20 g | 120 | 20 | 3.15 |
| 50 g | 135 | 22 | 3.15 |
| 100 g | 150 | 25 | 4 |
| 200 g | 170 | 25 | 5 |
| 500 g | 200 | 30 | 5 |
| 1 kg | 250 | 40 | 6 |
| 2 kg | 300 | 45 | 6 |
| 5 kg | 450 | 50 | 6 |
| 10 kg | 500 | 58 | 8 |
| 20 kg | 600 | 58 | 10 |
| 50 kg | 750 | 100 | 15 |
| 100 kg | 1000 | 110 | 18 |
| 200 kg | 1250 | 125 | 25 |

(b) Open Pattern (Bridge) Type with pointer above Beam

| | | | |
|--------|------|-----|----|
| 200 g | 170 | 25 | 5 |
| 500 g | 260 | 37 | 5 |
| 1 kg | 310 | 44 | 5 |
| 2 kg | 350 | 48 | 5 |
| 5 kg | 450 | 60 | 6 |
| 10 kg | 500 | 70 | 8 |
| 20 kg | 600 | 80 | 10 |
| 50 kg | 750 | 120 | 15 |
| 100 kg | 1000 | 150 | 20 |

TABLE 6—Leading dimensions of beam for beam scales—Class 'B'
(Flat and open pattern type with pointer below the beam)

| Capacity | Length between the ends (Nominal) L—mm. | Depth at the centre (Nominal) D—mm | Thickness of plate at the centre knife-edge (nominal) T—mm |
|----------|---|------------------------------------|--|
| 2 g | 70 | 3 | 2 |
| 5 g | 95 | 3 | 2 |
| 10 g | 110 | 4 | 2 |
| 20 g | 120 | 20 | 3.15 |
| 50 g | 135 | 20 | 3.15 |
| 100 g | 150 | 20 | 4 |
| 200 g | 200 | 20 | 6 |
| 500 g | 235 | 25 | 8 |
| 1 kg | 300 | 30 | 8 |
| 2 kg | 320 | 30 | 9 |
| 5 kg | 250 | 32 | 10 |
| 10 kg | 400 | 40 | 12 |
| 20 kg | 500 | 50 | 14 |
| 50 kg | 700 | 70 | 18 |
| 100 kg | 800 | 80 | 20 |
| 200 kg | 1250 | 125 | 25 |

TABLE 7—Leading dimensions of beam for beam scales—Class 'C'
(Swan neck type)

| Capacity | Length between the ends (nominal) L—mm | Depth at the centre (nominal) D—mm | Thickness of plate at the centre knife-edge (Nominal) T—mm |
|----------|--|------------------------------------|--|
| 100 g | 150 | 30 | 4 |
| 200 g | 200 | 40 | 5 |
| 500 g | 300 | 40 | 6 |
| 1 kg | 350 | 45 | 6 |
| 2 kg | 400 | 45 | 6 |
| 5 kg | 500 | 70 | 6 |
| 10 kg | 600 | 80 | 6 |
| 20 kg | 750 | 116 | 6 |
| 50 kg | 900 | 108 | 8 |
| 100 kg | 1200 | 154 | 14 |
| 200 kg | 1350 | 138 | 16 |
| 300 kg | 1650 | 148 | 18 |
| 500 kg | 1800 | 178 | 25 |
| 1000 kg | 2000 | 200 | 32 |

TABLE 8—Leading dimensions of beam for beam scales—Class ‘C’
(Dutch-end type)

| Capacity | Length between the end knife-edge (nominal) L—mm | Depth at the centre (nominal) D—mm | Thickness of plate at the centre knife-edge (nominal) T—mm |
|----------|--|------------------------------------|--|
| 100 g | 150 | 35 | 4 |
| 200 g | 200 | 40 | 5 |
| 500 g | 300 | 40 | 6 |
| 1 kg | 350 | 45 | 6 |
| 2 kg | 400 | 45 | 6 |
| 5 kg | 450 | 75 | 6 |
| 10 kg | 450 | 70 | 8 |
| 20 kg | 600 | 70 | 8 |
| 50 kg | 750 | 80 | 8 |
| 100 kg | 900 | 120 | 14 |
| 200 kg | 900 | 133 | 16 |
| 300 kg | 1050 | 142 | 16 |
| 500 kg | 1350 | 192 | 20 |
| 1000 kg | 1650 | 203 | 25 |

TABLE 9—Leading dimensions of beam for beam scales—Class ‘D’

| Capacity | Length between the end knife-edge (nominal) L—mm | Depth at the centre (nominal) D—mm | Thickness of plate at the centre (nominal) T—mm |
|--------------------------------|--|------------------------------------|---|
| 1 kg | 350 | 45 | 6 |
| 2 kg | 400 | 45 | 6 |
| 5 kg | 550 | 70 | 6 |
| 10 kg | 600 | 80 | 6 |
| 20 kg | 750 | 116 | 6 |
| 50 kg | 900 | 108 | 8 |
| 100 kg | 1200 | 154 | 14 |
| 200 kg | 1350 | 138 | 16 |
| 300 kg | 1650 | 148 | 18 |
| (b) With detachable flat hooks | | | |
| 500 kg | 1800 | 178 | 25 |
| 1000 kg | 2000 | 200 | 32 |

SCHEDULE VI

PART III—COUNTER MACHINES

1. Definition—
1. A Counter machine is an equal armed weighing instrument of capacity not exceeding 50 kg. the pans of which are above the beam Figure 1 illustrates a typical counter machine.

Fig. 1—Counter machine

2. Capacities—
The machine may be of the following maximum capacities: 500 g, 1 kg, 2 kg, 3 kg, 5 kg, 10 kg, 15 kg, 20 kg, 25 kg, and 50 kg.

3. General Requirements—
(a) When the beam or body has two sides, they shall be connected together by not less than two cross bars. The supports for the pans shall be of suitable rigid structure such as cross members strengthened by straps. Central pieces or forks shall be fixed so that they are not twisted or dislocated.
(b) Bearing surface, knife-edges and points of contact of all stays, hooks and loops shall be of hard steel or agate. The knife-edges and bearings shall be so fitted as to allow the beam to move freely. The knife-edges shall rest upon the bearings along the whole length of their working part.

(c) A counter machine may have a balance box for minor adjustments. In such case, the balance box shall be permanently fixed beneath the weight pan and shall be large enough to contain loose material to an amount up to one per cent of the capacity of the machine. No other adjustment contrivance shall be used.

(d) The pans may be of any suitable material such as mild steel, stainless steel, brass or bronze. They may be of any convenient shape.

(e) The minimum fall either way, on counter machines shall be as follows:—

| Capacity | Fall |
|---------------------------|-------|
| 500 g, 1 kg and 2 kg | 6 mm |
| 3 kg, 5 kg, 10 kg, 15 kg. | 10 mm |
| 20 kg, and 25 kg | 12 mm |
| 50 kg | 13 mm |

4. Tests—
(a) The machines shall be tested on a horizontal level plane
(b) Sensitiveness and error—(i) The machine shall be tested for sensitiveness at full load with the beam in horizontal position. The addition of the weight specified in cols. 2 or 4 as the case may be in Table 1 shall cause the pointer to rise or fall to the limit of its range of movement.
(ii) The error is the weight, if any required to bring the beam of the instrument to a horizontal position when fully loaded with weights equal to its capacity on both pans. It shall not exceed the limits specified in cols. 3 and 5 as the case may be of Table 1.

(c) The test for sensitiveness shall be carried out only with the pans loaded to the full capacity of the machine.

(d) When the good pan is in the form of a scoop, the machine shall be correct to the prescribed limits of error if half the full load is placed against the middle of the back of the scoop and the other half at any position on the scoop.

(e) When the goods pan is not in the form of a scoop the counter machines shall indicate the same weight within half the prescribed limits of error, if the centre of a load equal to half the capacity is placed on the goods from anywhere within a distance from the centre equal to end-third of the greatest length of the pan, or if the pan has a vertical side against the middle of that side, the weight being entirely on the weight pan, but in any position on it.

TABLE 1—Sensitiveness and errors for counter machines

| Capacity | Verification | | Inspection | |
|----------|---------------------------------|--|---------------------------------|--|
| | Sensitiveness when fully loaded | Greatest error allowed in excess or deficiency when fully loaded | Sensitiveness when fully loaded | Greatest error allowed when fully loaded |
| 500 g. | 1.5 g | 2.2 g | 4.5 g | 4.5 g |
| 1 kg | 2.0 g | 3.0 g | 6.0 g | 6.0 g |
| 2 kg | 3.0 g | 4.5 g | 9.0 g | 9.0 g |
| 3 kg | 4.0 g | 6.0 g | 12.0 g | 12.0 g |
| 5 kg | 6.0 g | 9.0 g | 18.0 g | 18.0 g |
| 10 kg | 7.0 g | 10.5 g | 21.0 g | 21.0 g |
| 15 kg | 8.0 g | 12.0 g | 24.0 g | 24.0 g |
| 20 kg | 9.0 g | 13.5 g | 27.0 g | 27.0 g |
| 25 kg | 10.0 g | 15.0 g | 30.0 g | 30.0 g |
| 50 kg | 15.0 g | 30.0 g | 45.0 g | 60.0 g |

5. Sealing—Each machine shall be provided with a plug or stud of soft metal on a conspicuous part of the beam or body for receiving a seal. Such a plug or stud shall be made irremovable by undercutting it or by some suitable method.

SCHEDULE VI

PART IV—STEELYARDS

1. Definition—
A steelyard means an unequal armed balance.
2. Capacities—
Steelyards may be of the following capacities:
3 kg, 10 kg, 20 kg, 50 kg, 100 kg, 150 kg, 200 kg, 250 kg, 300 kg, 500 kg, and 1000 kg.

3. Design and Construction—

- (a) The general design of steelyard shall be as given in Fig. 1.
- (b) Steelyards shall be made of either mild steel or stainless steel.
- (c) The shank shall be perfectly straight but its cross-section need not necessarily be uniform throughout. Notches or graduations on the shank shall be out in one plane and at right angles to the shank.
- (d) The design of the sliding poise shall be such that the nib remains secure in the notch.
- (e) Steelyards shall be provided with a stop or other suitable arrangement to prevent excessive oscillation of the shank.
- (f) The sliding poise and suspending hooks shall be securely attached to the instrument. All end-fitting such as the nut attached to prevent the poise carrier riding off the steelyard, shall be securely fixed to the shank. The sliding poise shall be freely movable and there shall be a stop to prevent it from travelling behind the zero mark. Steelyards having counter-poise or travelling poise shall be provided with a hole or other suitable means for the future adjustment of the counterpoise or travelling poise, such hole being undercut. Wherever loose material is used in the travelling poise, it shall be securely enclosed.
- (g) Steelyards shall be neither reversible nor have three hooks, and shall not be of counter type.
- (h) Steelyards shall be provided with a vertical pointer directly above the fulcrum to indicate the true equilibrium.
- (i) If a moveable hook, tray, or bucket, is used it shall form an essential part of the steelyard without which it is not possible to balance the steelyard.

4. Tests—

- (a) Steelyards shall be tested at full load for sensitiveness and error, and shall comply with the requirements of Table 1.
- (i) The test for sensitiveness shall be carried out at full load with the steelyard in horizontal position. The addition of the weight specified in column (2) or (4) of Table 1 shall make the steelyard turn.
- (ii) The error or the weight, if any required to bring the steelyard to a horizontal position when fully loaded shall not exceed the limits specified.
- (b) Each numbered graduation shall be tested and the instrument shall be correct whether the test is carried out with increasing or decreasing loads.
- (c) The intermediate graduations shall also be tested to see that they are correct and are at proper distance apart.
- (d) No test for sensitiveness at a lower load shall be made.

TABLE 1—Sensitiveness and errors for steelyards

| Capacity | Verification | | Inspection | |
|----------|---------------------------------|--|---------------------------------|--|
| | Sensitiveness when fully loaded | Greatest error allowed in excess or deficiency when fully loaded | Sensitiveness when fully loaded | Greatest error allowed in excess or deficiency when fully loaded |
| 1 | 2 | 3 | 4 | 5 |
| 5 kg | .. | 2.5 g | 3.8 g | 7.5 g |
| 10 kg | .. | 5 g | 7.5 g | 15 g |
| 20 kg | .. | 10 g | 15 g | 30 g |
| 50 kg | .. | 25 g | 50 g | 75 g |
| 100 kg | .. | 40 g | 80 g | 120 g |
| 150 kg | .. | 60 g | 120 g | 180 g |
| 200 kg | .. | 80 g | 160 g | 240 g |
| 250 kg | .. | 100 g | 200 g | 300 g |
| 300 kg | .. | 120 g | 240 g | 360 g |
| 500 kg | .. | 200 g | 400 g | 600 g |
| 1000 kg | .. | 400 g | 800 g | 1200 g |

5. Sealing—

Each instrument shall be provided with a plug or stud of soft metal on the front face of the shoulder of the steelyard for receiving the seal of the verification authority. Such a plug or stud shall

be made irremovable by under-cutting or by some other suitable method.

SCHEDULE VI

PART V—PLATFORM WEIGHING MACHINES

1. Definition—

(a) A platform weighing machine means a weighing instrument with compound levers and with the goods receptacle generally in the form of a platform. The capacity of these machines shall not exceed 2 tonnes and the weight of the load is indicated with steelyard or other form of indicator.

(b) The nomenclature of a platform weighing machine is given in Fig. 1 which shows a 'loose-weight' type machine. In the case of 'no-loose-weight' type machine, there are two sliding poises, one for the major bar and the other for the minor bar of the steelyard.

2. Capacities—

Platform weighing machines may be of the following capacities: 50 kg, 100 kg, 150 kg, 200 kg, 250 kg, 300 kg, 500 kg, 1000 kg, 1500 kg, 2000 kg, and 3000 kg.

3. General requirements—

(a) *Steelyard*—(i) The steelyard in the platform weighing machine shall not have any readily removable part except the support for proportional weights. There shall be one or more stops to prevent the sliding poise or poises from travelling behind the zero mark. The minimum travel of a steelyard in platform machines shall be 10 mm either way.

(ii) The top and bottom of the guide and/or steelyard shall be fitted with non-magnetic material.

(iii) When the steelyard is provided with notches, these shall be suitably protected.

(iv) The value of the smallest division on the minor bar shall not exceed the greatest error allowed for that capacity except for machines of capacities 200 kg and below in which case the value of the smallest division may exceed error prescribed for that capacity but shall not exceed 100 g.

(v) The value of the smallest graduation on dials or minor steelyards, and wherever possible major steelyards shall be 1g, 2g, 5g, or any multiple by 10, or any power of 10 (for instance, 100, 1000 etc.) of any of these weights.

(b) *Platform*—(i) The permissible extension of the platform on either side of the box in the case of extended platform shall be not more than 25 per cent of the length of the box.

(ii) If a moveable hatch, barrow, frame or bucket is used with the ordinary platform, it shall form an essential part of machine without which it is not possible to balance the machine. The moveable hatch, barrow, frame or bucket shall be identified with the machine and when in position on the platform, it shall be as central as possible.

(c) *Balance Arrangements*—(i) Where a balance box is provided on the steelyard, the balancing ball shall not be easily accessible.

(ii) The balancing arrangement for daily wear and tear shall have a range not exceeding 0.5 per cent of the capacity of the machine and not less than 0.125 per cent of the capacity each way (see Table 1). The balance box containing the balancing ball shall be securely attached to the steelyard, preferably by passing a bolt through the casing to the steelyard. The balancing ball shall be actuated by a detachable key.

(d) In the case of platform machines provided with dials:

(i) The racks and pinions shall be of suitable hardwearing material and shall be finished smooth;

(ii) the extremity of the pointer shall, in no position be at a greater distance than 5 mm from the graduated surface of the dial. Further, the extremity of the pointer shall be on the graduated portion of the dial, and it shall be so made as not to obscure the graduations or make them difficult to read; and

(iii) the dial shall be graduated into equal parts and the minimum width between the graduations shall be not less than 2 mm.

(c) The machine may, if required, have arrangement for marking up the tare.

(f) For machines without proportional weights, the total capacity shall be that indicated on the major steelyard.

4. Proportional weights

(a) All loose proportional weights in a platform machine shall be identified with the machine by a number or any other suitable mark of identification, which shall be indelible. The counterpoise weights shall be marked with their equivalent weights as indicated in Fig. 2.

(b) The proportional weights shall be hexagonal in shape with a slot of suitable size to allow them being placed on the counter balance (see Fig. 2).

(c) The proportional weights shall be made of cast iron or brass.

(d) The proportional weights shall have one rectangular loading hole which shall be undercut or tapering outwards so as to hold lead securely for adjustments. The undercut hole shall be reason-

ably large to accommodate the lead required for adjustments. The surface of the lead in the loading hole of a new proportional weight shall be at least 5 mm. inside from the bottom surface of the weight.

(c) In the case of platform machines provided with proportional weights, the smallest denomination of the proportional weights shall be equivalent to the weights represented by the maximum graduation on the steelyard.

(d) The denomination of the proportional weights shall be 1 kg, 2 kg, 5 kg or a multiple or sub multiple by 10 or a power of 10 (100, 1,000 etc.) of any of these weights. Any number of proportional weights in any one of the aforesaid denominations may be included provided the total of all the proportional weights does not exceed the capacity of the weighing instrument.

Note—While arriving at the capacity of the platform machines, the maximum graduation shown on the steelyard in the case of loose-weight platform machines and on the minor bar in the case of 'non loose-weight' type machines shall not be taken into account.

(g) The total capacity of the machine shall include the capacity of graduated tare bar or bars wherever provided.

Note—When tare bars are used and are not graduated except with a zero mark only, they shall not be taken into account when calculating the capacity of the machines. Ungraduated tare bars shall be marked with zero.

5. Tests and Test Requirements—

(a) The steelyard of a platform weighing machine shall remain horizontal at no-load.

(b) Platform weighing machines shall be tested to verify the accuracy of graduations or notches upto the total capacity.

(c) All loose proportional weights, where these are provided, shall be tested and then suitably sealed to prevent tempering.

(d) With one quarter of the maximum load (or as near thereto as practicable) placed in the middle or at any of the corners of the platform, the platform weighing machine shall show the correct weight within half the limits of error prescribed in Table 2 in Col. 3 for non dial type machines and in Col. 4 for dial type machines.

(e) Platform weighing machines with steelyard arrangement shall be tested for sensitiveness and error at full load or as near to it as practicable. The sensitiveness and permissible error shall not exceed the limits prescribed in Col. 2 and 3 respectively of Table 2.

(f) The machines shall be tested at loads corresponding to the major divisions or notches.

(g) With the exception of sensitiveness test (see 'c' above), the other tests mentioned above shall be carried out in a similar manner on dial type machines also. These machines shall comply with the requirements prescribed in Col. 4 of Table 2.

6. Sealing—

(a) Platform machines of the dial type shall be fitted with a soft metal plug for receiving the seal of the verification authority and wherever practicable, this plug shall be passed through the dial and frame. The plug or stud fitted on the dial shall be so supported as to prevent the risk of any damage to the instrument.

(b) On platform machines other than those of the dial type, a plug or stud shall be provided in a conspicuous position on the indicating lever or steelyard.

TABLE 1—Range of Balancing Arrangement

| Capacity | Range of Balancing Arrangement | |
|-----------------|--------------------------------|--|
| | Max. 0.5 per cent of capacity | Min. 0.125 per cent of capacity each way |
| 1 | 2 | 3 |
| 50 kg | 250 g | 60 g |
| 100 kg | 500 g | 125 g |
| 150 kg | 750 g | 185 g |
| 200 kg | 1.0 kg | 250 g |
| 250 kg | 1.3 kg | 310 g |
| 300 kg | 1.5 kg | 350 g |
| 500 kg | 2.5 kg | 625 g |
| 1000 kg | 5 kg | 1.25 kg |
| 1500 kg | 7.5 kg | 1.88 kg |
| 2000 kg | 10.0 kg | 2.50 kg |
| 3000 kg | 15.0 kg | 3.25 kg |

TABLE 2—Sensitiveness and errors for platform machines

| Capacity | Verification | | | Inspection | | |
|-----------------|---------------------------------|---|--|---------------------------------|---|---|
| | Sensitiveness when fully loaded | Greatest error allowed in excess or in deficiency when fully loaded for | | Sensitiveness when fully loaded | Greatest error allowed in excess or in deficiency when fully loaded for | |
| | | Non dial type machines | Platform machines fitted with dials | | Non-dial type machines | Platform Machines fitted with dials |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 50 kg | 10 g | 20 g | A weight corresponding to one half the interval between consecutive graduations. | 30 g | 40 g | A weight corresponding to the interval between consecutive graduations. |
| 100 kg | 20 g | 40 g | | 60 g | 80 g | |
| 150 kg | 30 g | 60 g | | 90 g | 120 g | |
| 200 kg | 40 g | 80 g | | 120 g | 160 g | |
| 250 kg | 50 g | 100 g | | 150 g | 200 g | |
| 300 kg | 60 g | 120 g | | 180 g | 240 g | |
| 500 kg | 100 g | 200 g | | 300 g | 400 g | |
| 1000 kg | 125 g | 250 g | | 375 g | 500 g | |
| 1500 kg | 200 g | 400 g | | 600 g | 800 g | |
| 2000 kg | 250 g | 500 g | | 750 g | 1000 g | |
| 3000 kg | 300 g | 1000 g | | 900 g | 2000 g | |

SCHEDULE VI

PART VI—SPRING BALANCES

1. Definition—

(a) A spring balance is an instrument which, on the application of the load to be weighed, indicates the whole weight by the extension or compression of a spring, such extension or compression being registered by means of a pointer on a dial.

(b) The general arrangement of spring balance without scoop and support is illustrated in Fig. 1.

2. Capacities—

The spring balance shall be of one of the capacities shown in Table 1.

3. General Requirements—

(a) In addition to the general requirements specified in Part 1 of this Schedule, spring balance shall comply with the requirements given below:

(b) The spring balance with the goods pan below the spring shall be suspended permanently from a stand, support or bracket.

(c) If pans are provided for the balances, they shall be made of brass, bronze, cast iron, mild steel or stainless steel. Metal chains or metal supports shall be provided if pans are suspended. When mild steel is used, it shall be suitably protected against corrosion.

(d) The extremity of the pointer shall not exceed 1.0 mm. in width and shall not be more than 5.0 mm away from the graduation on the dial.

(e) The dial shall be graduated into equal parts, and the width apart of the graduations shall be not less than 2 mm.

(i) The weight corresponding to the interval between consecutive graduation marks shall not exceed the values given in Table 1.

(ii) When the graduation commences at a fixed load, the position of the index, when there is no load shall be clearly indicated by a zero mark.

(f) When a spring balance is provided with an adjustable indicator, the range of adjustment shall not exceed one percent of the capacity of the instrument, except in the case of instruments used for mining purposes where it shall not exceed two percent.

(g) Spring balances shall have a device incorporated in the design to prevent overloading.

(h) The body of the spring balances shall be constructed of brass, cast iron, mild steel or any other suitable material, and shall be sufficiently robust in construction.

4. Tests—

(a) When the pan is below the spring, the prescribed limits of error shall not be exceeded, wherever the load is placed on it.

(b) If the pan is in the form of a scoop and half the full load is placed at the farthest point from the centre of the scoop and the other half at any position, the spring balance shall be correct to the prescribed limits of error.

(c) When the pan is not in the form of a scoop, the spring balance shall indicate the correct weight within half the prescribed limits of error, if the centre of a load equal to half the capacity is placed on the pan anywhere within a distance from the centre equal to one-third of the greatest length of the pan, or if that pan has a vertical side against the middle of that side, the weight being entirely on the weight pan.

(d) Each graduation shall be tested.

(e) The instrument shall be correct whether the test is made by progressively increasing or decreasing the loads, provided that in either case the spring shall be allowed to vibrate before the reading is taken.

(f) The balance shall be loaded to its capacity, and the load maintained for a period of 24 hours after which it shall be removed. Four hours after removal of the load, the balance shall not show any permanent set. Further, when tested as stated in (e) above, it shall record correct readings.

(g) Spring balances shall not be tested for sensitiveness.

5. Sealing—

Spring balances shall be fitted with a soft plug to receive a seal and wherever practicable, this plug shall pass through the dial or frame. The plug or stud shall be so supported as to allow to risk or injury to the instrument.

TABLE 1—Maximum Errors for Spring Balance

| Capacity | Weight corresponding to Interval between consecutive graduations Max. | Maximum Error | Remarks |
|----------|---|--|---|
| 1 | 2 | 3 | 4 |
| 1 kg | 5 g | A weight corresponding to 25 percent of the interval between successive graduations. | While fixing the diameter of effective circle on dial of one revolution, a blank space of the 15 mm at the end of graduations has to be provided. In the case of multi-revolution spring balances, the minimum blank space requirement shall not apply. |
| 2 kg | 20 g | | |
| 5 kg | 20 g | | |
| 10 kg | 50 g | | |
| 15 kg | 50 g | A weight corresponding to 50 percent of the interval between successive graduations. | |
| 20 kg | 100 g | | |
| 30 kg | 100 g | | |
| 50 kg | 200 g | | |
| 100 kg | 500 g | | |
| 150 kg | 1.0 kg | | |
| 200 kg | 1.0 kg | | |
| 300 kg | 1.0 kg | | |
| 500 kg | 2.0 kg | | |

Note—Inspection tolerances shall be double the values shown in Col. 3.

SCHEDULE VI

PART VII—WEIGHBRIDGES

1. Definition—

A weighbridge shall mean a weighing instrument constructed with compound levers, with the indicator system carried on foundations separate from the lever systems to weigh loads of capacities 1,000 kg (one tonne) and over, through the medium of proportional weights or indicating mechanism. A typical weighbridge is illustrated in Fig. 1.

2. Capacities—

Weighbridges may be of the following capacities:—

1 t, 2 t, 3 t, 5 t, 10 t, 15 t, 20 t, 25 t, 30 t, 40 t, 50 t, 60 t, 80 t, 100 t, 150 t, 200 t, 300 t and 400 t.

3. General Requirements—

(a) In addition to the general requirements specified in part I of this Schedule, weighbridges shall comply with the requirements given below:—

(b) **Framework**—Where the weighbridge is fitted with a framework, it shall be built up of mild steel sections or cast iron or cast steel. It shall be of rigid structure, suitably strengthened so that it is capable of resisting excessive vibrations and shall not throw the lever system out of alignment. Brackets shall be provided on the side and end frames to secure the framework.

(c) Steelyard—

(i) The steelyard of a weighbridge shall not have any readily removable parts except the support for the proportional weights. There shall be one or more stops to prevent the sliding poise or poises from travelling behind the zero mark.

(ii) The minimum travel of the steelyard in weighbridges shall be 15 mm each way.

(iii) The top and bottom of the guide and or steel-yard shall be fitted with non-magnetic material.

(iv) When the steelyard is provided with notches, the latter shall be suitably protected.

(v) The value of the smallest division on the minor bar shall not exceed the greatest error allowed for that capacity. (See Table 2).

(d) **Graduations**—The value of the smallest graduation on dial or minor steelyards, and wherever possible major steelyards of weighing instruments shall be 1 g, 2 g, 5 g, or any multiple by 10 or a power of 10 (for instance, 100, 1,000 etc.) of any of these weights.

(e) Platform—

(i) The platform shall be either chequered or plain, and shall be made of cast iron or steel plate. It shall be rigid and sufficiently strong to carry the maximum load. The foundation shall provide for a manhole to facilitate easy access to the pit.

(ii) If a movable hatch, barrow, frame or bucket is used with the ordinary platform, it shall form an essential part of the machine without which it is not possible to balance the machine. The movable hatch, barrow, frame or bucket shall be identified with the machine and when in position on the platform, it shall be as central as possible.

(f) **Balancing Arrangement**—The balancing arrangement for daily wear and tear shall have a range not exceeding 0.5 percent of the capacity of the machine and not less than 0.125 percent of the capacity each way. The balance box containing the balancing ball shall be securely attached to the steel rod, preferably by passing a bolt through the casting to the steelyard. The balancing ball shall be actuated by a detachable key.

(g) In the case of weighbridges provided with dials:—

(i) Racks and pinions shall be of suitable hardwearing material finished smooth.

(ii) The extremity of the pointer shall, in no position be at a greater distance than 5 mm from the graduated surface of the dial. Further, the extremity of the pointer shall be on the graduated portion of the dial, and it shall be so made as not to obscure the graduations or make them difficult to read.

(iii) The dial shall be graduated into equal parts and the minimum width between graduations shall be not less than 2 mm.

(h) For no-loose weight steelyard machines, the total capacity shall be that which is indicated on the steelyard.

1. Proportional Weights—

(a) All loose proportional weights shall be identified with the machine by a number or any other suitable mark of identification which shall be indelible. They shall be marked with their equivalent weights as shown in Fig. 2.

(b) Proportional weights shall be hexagonal in shape with a slot of suitable size to allow their being placed on the counter balance (see Fig. 2).

(c) The proportional weights shall be made of cast iron or brass.

(d) The proportional weights shall have one rectangular loading hole which shall be undercut or tapering outwards so as to hold lead securely for adjustment. The surface of the lead in the loading hole of a new proportional weight shall be at least 5 mm inside from the bottom surface of the weight.

(e) The smallest denomination of the proportional weight shall be equivalent to the weight represented by the maximum graduation on the minor bar.

(f) The denominations of the proportional weights shall be 1 kg, 2 kg, 5 kg or a multiple or submultiple by 10 or a power of 10 (100, 1,000 etc.) of any of these weights. Any number of proportional weights in any one of the aforesaid denominations may be included provided the total equivalent of all the proportional weights does not exceed the capacity of the weighing instrument.

Note—While arriving at the capacity of the weighbridge, the maximum graduation shown on the steelyard in the case of 'loose-weight' weighbridges and on the minor bar in the case of 'no-loose-weight' type weighbridges shall not be taken into account.

(g) The total capacity of the machine shall include the capacity of graduated tare bar or bars wherever provided.

Note—When tare bars are used and are not graduated except with a zero mark only, they shall not be taken into account when calculating the capacity of the machines. Ungraduated tare bars shall be marked with zero.

5. Tests and Test Requirements—

(a) The steelyard of a weighbridge shall remain horizontal at no-load.

(b) Weighbridges shall be tested to verify the accuracy of graduations or notches upto the total capacity.

(c) All loose proportional weights, where these are provided, shall be tested and then suitably sealed to prevent tempering.

(d) With one quarter of the maximum load (or as near thereto as practicable) placed in the middle or at any of the corners of the platform, the weighbridge shall indicate the same weight within half the limits of error prescribed in Table 2 in col. 3 for non-dial type machines and in Col. 4 for dial type machines.

TABLE 1—Range of Balancing Arrangement

| Capacity | Range of Balancing Arrangement | |
|-------------|----------------------------------|---|
| | Maximum 0.5 per cent of capacity | Minimum 0.125 per cent of capacity each way |
| | 1 | 2 |
| | | 3 |
| | | kg |
| 1 t | 5 | 1.25 |
| 2 t | 10 | 2.50 |
| 3 t | 15 | 3.75 |
| 5 t | 25 | 6.20 |

| 1 | 2 | 3 |
|---------------|------|--------|
| | kg | kg |
| 10 t | 50 | 12.50 |
| 15 t | 75 | 19.00 |
| 20 t | 100 | 25.00 |
| 25 t | 125 | 31.00 |
| 30 t | 150 | 35.00 |
| 40 t | 200 | 50.00 |
| 50 t | 250 | 62.00 |
| 60 t | 300 | 75.00 |
| 80 t | 400 | 100.00 |
| 100 t | 500 | 125.00 |
| 150 t | 750 | 188.00 |
| 200 t | 1000 | 250.00 |
| 300 t | 1500 | 375.00 |
| 400 t | 2000 | 500.00 |

TABLE 2—Sensitiveness and Errors for Weighbridges

| Capacity of machine | Verification | | | Inspection | | |
|---------------------|---------------------------------|--|---|---------------------------------|--|---|
| | Sensitiveness when fully loaded | Greatest error allowed in excess or deficiency when fully loaded for | | Sensitiveness when fully loaded | Greatest error allowed in excess or deficiency when fully loaded for | |
| | | Non-dial type machines | Machines fitted with dials | | Non-dial type machines | Machines fitted with dials |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| t | kg | kg | | kg | kg | |
| 1 | 1.1 | 1.2 | A weight corresponding to one half the interval between consecutive graduations | 3.3 | 2.4 | A weight corresponding to the interval between consecutive graduations. |
| 2 | 1.2 | 1.4 | | 3.6 | 2.8 | |
| 3 | 1.3 | 1.6 | | 3.9 | 3.2 | |
| 5 | 1.5 | 2.0 | | 4.5 | 4.0 | |
| 10 | 2.0 | 3.0 | | 6.0 | 6.0 | |
| 15 | 2.5 | 4.0 | | 7.5 | 8.0 | |
| 20 | 3.0 | 5.0 | | 9.0 | 10.0 | |
| 25 | 3.5 | 6.0 | | 10.5 | 12.0 | |
| 30 | 4.0 | 7.0 | | 12.0 | 14.0 | |
| 40 | 5.0 | 7.0 | | 15.0 | 14.0 | |
| 50 | 5.2 | 7.8 | | 15.6 | 15.6 | |
| 60 | 5.5 | 8.5 | | 16.5 | 17.0 | |
| 80 | 6.0 | 10.0 | | 18.0 | 20.0 | |
| 100 | 6.5 | 11.5 | | 19.5 | 23.0 | |
| 150 | 7.8 | 15.2 | | 23.4 | 30.4 | |
| 200 | 9.0 | 19.0 | | 27.0 | 38.0 | |
| 300 | 15.0 | 30.0 | | 45.0 | 60.0 | |
| 400 | 20.0 | 40.0 | | 60.0 | 80.0 | |

(e) Weighbridges with steelyard arrangement shall be tested for sensitiveness and error at full load or as near to it as practicable. The sensitiveness and permissible error shall not exceed the limits prescribed in cols. 2 and 3 respectively of Table 2:

- (i) The machines shall be tested at loads corresponding to all major divisions or notches.
- (ii) With the exception of sensitiveness test, the other tests mentioned above shall be carried out in a similar manner on dial type machines also. These machines shall comply with the requirements prescribed in col. 4 of Table 2.

6. Identification of Parts—

Detachable parts which may affect the accuracy of the weighbridge shall be indelibly numbered or marked so as to facilitate identification.

7. Sealing—

- (a) Dial machines shall be fitted with a soft metal plug for receiving the seal of the verification authority and wherever practicable, this plug shall be passed through the dial and frame. The plug or stud fitted on the dial shall be so supported as to allow no risk of damage to the instrument.
- (b) On weighbridges other than dial machines, a plug or stud shall be provided in a conspicuous position on the indicating lever or steelyard

SCHEDULE VI

PART VIII—Crane Weighing Machines

1. Definition—

A crane weighing machine is a weighing instrument designed on lever or spring principle specially constructed for suspension from the hook of a crane and fitted with a hook for lifting the load.

Note—A lever type machine with open steelyard is illustrated in Fig. 1, Fig. 2 illustrates a dial type machine.

2. Capacities—

Crane weighing machines may be of the following capacities:—

500 kg, 1 tonne, 2 tonnes, 3 tonnes, 5 tonnes, 10 tonnes, 15 tonnes, 20 tonnes, 30 tonnes, 50 tonnes, 100 tonnes and 200 tonnes.

3. General Requirements—

- (a) In addition, to the general requirements in part I of the Schedule, crane weighing machines shall comply with the following requirements:
- (i) The machine shall be sufficiently strong of withstand wear and tear in the exacting conditions under which it works.
- (ii) No crane weighing machine shall become a permanent link in the lifting gear.

- (iii) All working parts in a crane weighing machine shall as far as possible, be suitably protected from the dust and damp of the atmosphere. In a lever type machine, the steelyard shall be made of corrosion-resistant steel to withstand atmospheric influence and shall be sufficiently rigid and accurate.
- (iv) In dial type machines, the racks and pinions shall be of suitable hard wearing material and finished smooth.
- (v) The range of balancing or adjusting arrangement shall not exceed 2 per cent of the capacity of the machine (see Table 3).
- (vi) In a steelyard type machine, there shall be free movement of the steelyard. In a dial type machine, the dial indicator shall work freely and return to its initial starting point after the load is removed.
- (vii) In the case of a crane weighing machine provided with hooks, trays or slings, these shall form essential parts without which it is not possible to balance the machine. These shall be identified with the machine.
- (viii) The value of the smallest graduation on dials or minor steelyards and, wherever possible, major steelyards shall be 1 g, 2 g, 5 g, or any multiples of 10 or a power of 10, (for instance 100, 1,000 etc.) of any of these weights.
- (ix) The total capacity of the machines shall include the capacity of graduated tare bar or bars wherever provided.

Note—When tare bars are used and are not graduated except with a zero mark only, they shall not be taken into account when calculating the capacity of the machines. Ungraduated tare bars shall be marked with zero.

4. Tests—

(a) Crane machines of the steelyard type shall be tested for sensitiveness and greatest error at full load and shall comply with the requirements of Table 1.

(b) Crane machines of the dial type shall be tested for greatest error at full load and shall comply with the requirements of Table 2.

(c) Spring type crane machines shall not be tested for sensitiveness.

(d) For spring type machines, the limits of greatest error shall be double of those prescribed for steelyard machines (see Table 1).

(e) Each numbered graduation shall be tested and the instrument shall be correct whether the test is carried out with increasing or decreasing loads.

(f) The intermediate graduations shall also be tested to see that they are correct and are at proper distance apart.

(g) No test for sensitiveness at a load lower than the full load shall be made.

5. Sealing—

Crane machines shall be fitted with an irremovable plug in a conspicuous part either on the steelyard or on the dial, to receive the seal of the verification authority.

TABLE 1—Limits for Sensitiveness and greatest Errors for Crane Weighing Machines—Steelyard Type

| Capacity | Verification | | Inspection | |
|----------|----------------------------------|---|----------------------------------|---|
| | Sensitive-ness when fully loaded | Greatest error allowed in excess or in deficiency when fully loaded | Sensitive-ness when fully loaded | Greatest error allowed in excess or in deficiency when fully loaded |
| 1 | 2 | 3 | 4 | 5 |
| 500 kg | 100 g | 200 g | 300 g | 400 g |
| 1 t | 1.1 kg | 1.2 kg | 3.3 kg | 2.4 kg |
| 2 t | 1.2 kg | 1.4 kg | 3.6 kg | 2.8 kg |
| 3 t | 1.3 kg | 1.6 kg | 3.9 kg | 3.2 kg |
| 5 t | 1.5 kg | 2.0 kg | 4.5 kg | 4.0 kg |
| 10 t | 2.0 kg | 3.0 kg | 6.0 kg | 6.0 kg |
| 15 t | 2.5 kg | 4.0 kg | 7.5 kg | 8.0 kg |
| 20 t | 3.0 kg | 5.0 kg | 9.0 kg | 10.0 kg |
| 30 t | 4.0 kg | 7.0 kg | 12.0 kg | 14.0 kg |
| 50 t | 5.2 kg | 7.8 kg | 15.6 kg | 15.6 kg |
| 100 t | 6.5 kg | 11.5 kg | 19.5 kg | 23.0 kg |
| 200 t | 9.0 kg | 19.0 kg | 27.0 kg | 38.0 kg |

TABLE 2—Limits for Greatest Error for Crane Weighing Machines Dial Type

| Capacity | Minimum Weights corresponding to interval between successive graduations | Greatest error allowed in excess or deficiency when fully loaded | |
|----------|--|--|---|
| | | Verification | Inspection |
| 1 | 2 | 3 | 4 |
| 500 kg | 5 kg | A weight corresponding to half the interval between successive graduations | A weight corresponding to the interval between successive graduations |
| 1 t | 5 kg | | |
| 2 t | 5 kg | | |
| 3 t | 10 kg | | |
| 5 t | 25 kg | | |
| 10 t | 50 kg | | |
| 15 t | 50 kg | | |
| 20 t | 100 kg | | |
| 30 t | 100 kg | | |
| 50 t | 250 kg | | |
| 100 t | 500 kg | | |
| 200 t | 500 kg | | |

TABLE 3—Range of Balancing Arrangement

| Capacity | Range of Balancing Arrangement |
|----------|--------------------------------|
| 500 kg | 10 kg |
| 1 t | 20 kg |
| 2 t | 40 kg |
| 3 t | 60 kg |
| 5 t | 100 kg |
| 10 t | 200 kg |
| 15 t | 300 kg |
| 20 t | 400 kg |
| 30 t | 600 kg |
| 50 t | 1000 kg |
| 100 t | 2000 kg |
| 200 t | 4000 kg |

PART IX—Automatic Weighing Machines

1. Definition—

An automatic weighing machine may be defined as any weighing scale which has an integral mechanism for automatically admitting and discharging a load, and may be fitted with an apparatus for counting or otherwise recording the number of loads handled.

2. Capacities—

Automatic machines shall be of the capacities as agreed upon between the purchaser and the seller.

3. Design and Construction—

(a) Automatic weighing machines and their integral parts, shall be identified with the machines, by an indelible number or other mark of identification.

(b) The adjusting mechanism shall be suitably secured or constructed so that it cannot be tampered with.

(c) The capacity of the automatic weighing machine shall be marked legibly on a conspicuous part of the machine.

4. Tests—

(a) Automatic Machines shall be tested for errors according to the requirements of Table 29.

(b) The accuracy of the output of the machine shall be verified by reweighing in another weighing instrument not less than 20 continuous loads or, where practicable, the machine may be tested directly by the application of standard weights.

(c) In testing totalling machines, not less than 50 loads shall be passed over the machine, namely 10 minimum loads 10 maximum loads and 30 loads of the mean between the minimum and the maximum.

5. *Sealing*—

Automatic Machines shall be fitted with a plug on the beam, shank or dial of the machine to receive the seal

TABLE 1—Permissible Errors for Automatic Machines

| Use | Capacity | Error (Verification or Inspection) |
|---|---------------------|---|
| Weighting small loads of tea, coffee etc. | 20 g and upwards | 0.5 per cent of the load in excess only. |
| Weighting grain etc. | 5 kg and upwards | 0.25 per cent of the load in excess or deficiency. |
| Weighting Coal etc. | 50 kg and upwards. | 0.5 per cent of the load in excess or deficiency. |
| "Totalising" machines used for weighing coal etc. | 500 kg and upwards. | 0.5 per cent of the total load of 50 weighings in excess or deficiency. |

(h) When tare bars are graduated, they shall only be permitted provided the chart capacity and the total capacity (chart plus tare bar) comply with capacities shown in Table 1.

Note When tare bars are used and are not graduated except with a zero mark, they shall not be taken into account when calculating the capacity of the machine. Ungraduated tare bars shall be marked with zero.

4. *Tests*—

(a) All self-indicating and semi-self-indicating machines shall be tested on a horizontal level plane

(b) The machines shall be tested throughout the full range of their capacity by progressively increasing the load, the permissible error shall not exceed the limits specified in Table 1.

(c) When the pans are loaded to half the capacity there shall be no appreciable difference in the weight indicated on the dial when the load is moved within a distance from centre equal to one third from the greatest length of the pan.

(d) When the goods pan is in the form of a scoop, the machine shall be correct to the prescribed limits of error if half the full load is placed against the middle of the back of the scoop and the other half in any position on the scoop.

(e) Self indicating and semi self-indicating machines shall not be tested for sensitiveness.

5. *Sealing*—

(a) Each machine shall be provided with a plug or stud of soft metal on a conspicuous part of the beam or body for receiving a seal. Such a plug or stud shall be made immovable by under cutting it or by some other suitable manner.

SCHEDULE VI

PART X—Self Indicating and Semi Self Indicating Counter Type Weighing Machines

1. *Definition*—

(a) *Self-Indicating Machine*—A machine which on the application of the load to be weighed, indicate the whole of the load automatically. A typical self-indicating machine is illustrated in Fig. 1.

(b) *Semi-Self-Indicating Machine*—A machine which, on the application of the load to be weighed, indicates automatically only a portion of the weight of the whole load leaving the remainder to be balanced by weights or sliding poises fitted to the tare or capacity bars or by any other suitable means. A typical semi self indicating machine is illustrated in Fig. 2.

2. *Capacities*—

The self-indicating or semi self indicating machines may be of the capacities shown in Table 1.

3. *General Requirements*—

(a) Self-indicating or semi self indicating machines are generally constructed by incorporating a beam or levers coupled to a pendulum or other type of resistance system, excluding springs, so as to produce an indicating arrangement for the machine. The arrangement of the lever system of machine shall be such that the horizontality of the goods and weight pan fittings throughout the movement of the beam is preserved. The machine shall be provided with dashpot or any other suitable arrangement so as to bring the pointer quickly to rest.

(b) The supports for the pans shall be of a suitable rigid structure. The pans shall be made of mild steel, stainless steel, brass or bronze, aluminium or its alloys, porcelain, enamel coated steel glass or plastic material.

(c) The bearing surfaces, knife edges and points of contact of all stays, hooks and loops shall be of hard steel or agate. The knife edges and bearings shall be so fitted as to allow the beam to move freely and the knife edges shall rest on their bearings at practically their entire length. All levers and resistance mechanism shall be enclosed as far as possible.

(d) The machines shall have a balance box for minor adjustments. The balance box shall be permanently fixed, preferably beneath the weight pan, and shall be large enough to contain loose material to an amount up to one per cent of the capacity of the machine. No other adjusting contrivance shall be used. In case of self-indicating machines, the balance box shall be fixed below the goods pan.

(e) The chart of the machines shall be graduated into equal parts and the width apart of the graduations shall be not less than 1.5 mm (unless magnification is provided on the chart) for a capacity of 10 kg and under, and not less than 2 mm for a capacity above 10 kg. The weights corresponding to one half the interval between consecutive graduation marks shall not exceed the greatest error allowed as shown in Table 1. The extremity of the pointer shall not exceed one millimetre in width and shall not be more than 3 mm away from the chart. The position of the index when there is no load shall be clearly indicated by zero mark.

(f) The value of the minor graduation on the chart shall correspond to one of the weights in the series 1 g, 2 g, 5 g or its decimal multiples of 10 or of powers of 10

(g) The self indicating and semi-self-indicating machines, excepting out of level scales, shall be provided with levelling screws and a circular bubble.

TABLE 1—Limits for Greatest Error for Self-Indicating and Semi-Self Indicating Counter Type Weighing Machine

| Capacity | Max. Value of the minor graduation | Greatest error allowed in excess or in deficiency when fully loaded | |
|-----------------------------------|------------------------------------|---|------------|
| | | Verification | Inspection |
| 1 | 2 | 3 | 4 |
| (A) Self-Indicating Machines | | | |
| 100 kg | 200 g | 100 g | 200 g |
| 50 kg | 100 g | 50 g | 100 g |
| 30 kg | 100 g | 50 g | 100 g |
| 20 kg | 100 g | 50 g | 100 g |
| 10 kg | 50 g | 25 g | 50 g |
| 5 kg | 20 g | 10 g | 20 g |
| 3 kg | 10 g | 5 g | 10 g |
| 2 kg | 10 g | 5 g | 10 g |
| 1 kg | 10 g | 5 g | 10 g |
| 500 g | 5 g | 2.5 g | 5 g |
| 200 g | 2 g | 1.0 g | 2 g |
| 100 g | 1 g | 0.5 g | 1 g |
| (B) Semi-self-Indicating Machines | | | |
| 100 kg | 100 g | 50 g | 100 g |
| 50 kg | 40 g | 20 g | 40 g |
| 30 kg | 30 g | 15 g | 30 g |
| 20 kg | 20 g | 10 g | 20 g |
| 10 kg | 10 g | 5 g | 10 g |
| 5 kg | 10 g | 5 g | 10 g |
| 3 kg | 10 g | 5 g | 10 g |
| 2 kg | 10 g | 5 g | 10 g |
| 1 kg | 10 g | 5 g | 10 g |
| 500 g | 4 g | 2 g | 4 g |
| 200 g | 2 g | 1 g | 2 g |
| 100 g | 1 g | 0.5 g | 1 g |

Note—The maximum error shall not exceed the value of half the minor division indicated on the chart.

SCHEDULE VI

PART XI—Person Weighing Machines

1. *Definition*—

(a) A person weighing machine means an instrument with compound levers and with a platform to receive the person to be weighed. The weight of the person is indicated with a steelyard or any other form of indicator or by a ticket printing device.

(b) Person weighing machine of steelyard, dial and ticket printing types are illustrated in Figs. 1, 2 and 3 respectively. These drawings are illustrative only and do not specify any particular design.

2. Capacity—

The person weighing machine shall have a capacity not less than 120 kg.

3. General Requirements—

(a) *Platform*—The maximum size of the platform shall be 400×350 mm. The platform shall not extend beyond the frame on any side.

(b) Steelyard Type Machine—

(i) The steelyard shall not have any readily removable parts except the support for proportional weights. The minimum travel of a steelyard shall be 10 mm either way.

(ii) The top and bottom of the guide and/or steelyard shall be fitted with non magnetic material, if these are made of ferrous material.

(iii) When the steelyard is provided with notches, the latter shall be suitably protected.

(iv) The value of the smallest division on the steelyard shall be graduated with $5 \text{ kg} \times 50 \text{ g}$ divisions.

(v) *Balancing Arrangement*—Where a balancing device is provided on the steelyard, the balance ball shall not be easily accessible. The balancing arrangement for daily wear and tear shall have a range not exceeding 0.5 per cent of the capacity of the machine and not less than 0.125 per cent of the capacity each way. The balancing device containing the balancing ball shall be securely attached to the steelyard. The balancing ball shall be actuated by knurled headed bolt passing through it.

(c) Dial Type Machines—

(i) Racks and pinions shall be of suitable hard wearing material and shall be finished smooth.

(ii) The extremity of the pointer shall in no position be at a greater distance from the graduated surface of the dial than 5 mm and shall be made to meet but not to obscure the graduation marks.

(iii) The dial shall be graduated into equal parts and the minimum width apart of the graduations shall not be less than 1.5 mm. The minimum graduation shall be 500 g.

(d) Ticket Printing Type Machines—

(i) Racks and pinions shall be of suitable hard wearing material and shall be finished smooth.

(ii) The weight shall be legibly indicated on the ticket.

4. Proportional Weights—

(a) All loose proportional weights shall be identified with the machine by a number or any other suitable mark of identification which shall be indelible. The counterpoise weights shall be marked with their equivalent weights in the following manner:

किगों 5 Kg.

(b) Proportional weights shall be hexagonal in shape with a slot of suitable size to allow them being placed on the counter balance.

(c) The proportional weights shall be made of cast iron or brass.

(d) The proportional weights shall have one rectangular loading hole which shall be undercut or tapering outside so as to hold lead securely for adjustment. The undercut hole shall be of reasonable size so as to accommodate the lead required for adjustments.

The surface of the lead in the loading hole shall not be less than 2 mm inside from the bottom surface of the weight.

(e) The steelyard type person weighing machine shall be provided with suitable proportional weights. The denominations of proportional weights shall be 1 kg, 2 kg, 5 kg, or a multiple or sub-multiple by 10 or a power of 10 (100, 1,000 etc.). The total value of the proportional weight shall not exceed the capacity of the machine. For the purpose of calculating total capacity the graduation on the steelyard shall not be taken into account.

5. Tests—

(a) The steelyard of the person weighing machine with steelyard arrangement shall remain horizontal at no load on the platform.

(b) With load weighing one quarter of the maximum capacity of the machine or as near thereto as is practicable, the weighing machine shall indicate the same weight within half the prescribed limits of error whether the load is placed in the centre or on any of the four corners of the platform.

(c) The machines shall be tested to verify the accuracy of graduations upto the total capacity.

(d) Person weighing machines with the steelyard arrangement shall be tested for error as well as for sensitiveness at full load. The permissible errors and sensitiveness are given in Table 1.

(e) Person weighing machines provided with dial type indicator or ticket printing device shall be tested for errors only. No sensitiveness test shall be taken on such machines. The permissible error at any load shall not exceed the limits prescribed in Table 1.

TABLE 1—Limits for Greatest Error for Persons Weighing Machines

| Type of Machine | Sensitivity when fully loaded | Greatest error allowed in excess or in deficiency when fully loaded | |
|------------------------------|-------------------------------|---|------------|
| | | Verification | Inspection |
| 1 | 2 | 3 | 4 |
| 1. Steelyard | 25 g | 50 g | 100 g |
| 2. Dial type | .. | 250 g | 500 g |
| 3. Ticket issuing type | .. | 500 g | 1 kg |

SCHEDULE VII

SPECIFICATIONS FOR COMMERCIAL MEASURING INSTRUMENTS

PART I—General Requirements

1. Definitions—

(a) A measuring instrument is a mechanism or machine designed to measure and/or deliver liquid products by volume.

The expression 'correct' means correct within the limits of errors prescribed in these rules.

2. Measuring instruments of the following categories are included into these specifications:

(a) Dispensing pumps.

(b) Meters used for the measurement of quantities of oil and/or liquids flowing through pipelines or in packages filling or deliveries to and from oil tanks, wagons, road vehicles, aviation refuellers etc.

(c) Volumetric container filling machines.

3. General Requirements—

(a) All commercial measuring instruments, viz., dispensing pumps, meters and volumetric filling machines shall be conspicuously, clearly and prominently marked for the purpose of identification, with the name, initials or registered trade mark of the manufacturer.

(b) The manufacturer's name or the registered trade mark shall be such as will not be mistaken for the stamp or seal of the Inspector.

(c) Every volumetric container filling machine shall have the capacity of the container prominently and indelibly marked on it.

(d) The mechanism or devices attached thereto or used in connection therewith shall be so constructed, assembled or installed as to minimise the possibility of fraudulent practices.

(e) All graduations indicating quantities delivered shall be clearly and indelibly marked.

(f) Every measuring instrument of a fixed type shall be so disposed that the purchaser has a clear and unobstructed view of the quantity indicated.

(g) No measuring instrument shall be so arranged as to deliver measured quantities at more than one outlet.

(h) Every graduated scale or other indicating device of the measuring instrument shall be in numerical sequence, reading in one direction only.

4. Tests—

(a) All measuring instruments shall be tested under normal operating conditions.

(b) The measuring instrument shall not be stamped unless it is complete with all parts and attachments concerned with the operation of measurement and/or delivery.

(c) The measuring instrument shall be provided with one or more plugs and suitable means of sealing them to prevent tampering with stops or other adjustable parts affecting the quantity delivered. Seals shall be provided by the makers or users of the machines for Inspector's stamp.

(d) Measuring instruments which are not portable as well as portable measuring instruments of the types the Controller may specify in this behalf, shall be verified and stamped *in situ*. In addition to any preliminary test in the manufacturers or dealer's premises, such a preliminary test shall be made at the request of the manufacturer or dealer.

SCHEDULE VI

PART II—Dispensing Pumps

1. Definitions—

(a) A dispensing pump is a measuring instrument used in conjunction with a storage tank or tanks for effecting deliveries of liquid products by specified volumes.

- (b) *‘Wet Hose’ System*—A type of device designed to be operated with the discharge hose full of liquid at all times. A ‘Wet Hose’ is the discharge hose in this type of device.
- (c) *‘Dry-Hose’ System*—A type of device in which the discharge hose is completely drained following each delivery. A ‘dry hose’ is the discharge hose in this type of device.

Types—

- (a) Dispensing pumps shall be either of the meter type or container type.

General Requirements—

- (a) A dispensing pump shall essentially consist of:
- (i) suitable casing or housing,
 - (ii) pumping unit,
 - (iii) metering unit or volumetric container,
 - (iv) register for quantities, and
 - (v) flexible hose with nozzle.

4. Every dispensing pump shall be provided with an individual sales indicator, graduated to indicate all possible deliveries. Any other counting or totalising device that may be provided, shall be so arranged as to avoid any possibility of confusion with the individual sales indicator.

5. A dispensing pump of meter type shall be so constructed that, after a particular delivery cycle has been completed by movement of the starting lever to its shut-off position, an effective automatic interlock shall prevent a subsequent delivery being started until the indicating elements have been returned to their correct zero position.

6. A dispensing pump of container type shall be so constructed that the individual sales indicator shall register only when the discharge from each container has commenced. A notice shall be prominently exhibited on the pump panel to indicate clearly and prominently the following:

PLEASE ENSURE BEFORE STARTING DELIVERY

(i) Sales indicator is set at zero.

(ii) Container is full.

7. Dispensing pumps of container type shall be provided with observation windows or other means for showing clearly that the container or containers are properly charged and discharged.

8. Dispensing pumps delivering the liquid under pressure shall work on the ‘Wet Hose’ system fitted with a nozzle having combination-control valve and automatic pressure discharge valve which should operate under the pressure at which the pumps is designed to deliver.

9. Dispensing pumps delivering liquid under gravity shall work on the ‘dry hose’ system. The ‘dry hose’ shall be of such length and stiffness as to facilitate complete and rapid drainage of the hose pipe and shall be provided with a nozzle without any valve.

10. The length of the discharge hose on a dispensing pump shall not exceed 5 metres from the outside of the housing of the pump to the inlet end of the discharge nozzle.

11. A dispensing pump of the meter type shall have an effective air eliminator unit situated after the pumping unit and immediately preceding the metering unit.

12. A dispensing pump of the container type shall have a suitable air vent to preclude the possibilities of air-trap in the volumetric container.

13. Tests—

- (a) All dispensing pumps shall be tested for accuracy of discharge as described hereunder.
- (b) A dispensing pump shall be tested under practical working conditions with the liquid that the instrument is intended to deliver.
- (c) All dispensing pumps shall be verified by check measures. The check measures may be of the denominations 1, 5, 10 and 20 litres.
- (d) Every check measure shall be verified against the appropriate working standard measure at least once in every period of six months and duly sealed.
- (e) Before commencing checking of dispensing pump, the pump shall be run for a few minutes to ensure that all the units are functioning smoothly and also the discharge hose has been wetted.
- (f) A dispensing pump before being tested for accuracy shall be tested for leakage by being first fully primed.

14. The procedure for testing a dispensing pump shall be as follows:

- (a) The standard check-measure shall first be filled to wet the entire inside surface. It shall then be emptied.

(b) The pointer (meter type) or reading (container type) of the recording mechanism shall then be set to zero.

(c) The pump shall be operated to dispense the liquid into the standard check measure unit the pointer (metre type) is at zero position again or the reading (container type) records the capacity of the check measure.

(d) If the quantity of liquid delivered is in error beyond the permissible limits, the instrument shall be adjusted so that it delivers a quantity within permissible limits of error.

(e) Steps (b), (c) or (d) shall be repeated until the pump gives two consecutive deliveries within permissible limits of error.

(f) If the instrument has been found to give correct measure in the initial test itself, further test of accuracy shall be made and recorded.

15. Every dispensing pump shall deliver correctly at reasonable uniform speed which shall be not less than 10 litres per minute.

16. The permissible limits of error are specified below:

| Quantity | Verification (Errors in excess) | Inspection | |
|-------------------|------------------------------------|--------------|-----------------|
| | | Error | Error |
| 20 litres | 100 ml. | Excess | Deficiency |
| 10 litres | 50 ml. | same as on | 50 ml. |
| 5 litres | 30 ml. | verification | 25 ml. |
| 1 litre | 10 ml. | | 15 ml. 5 ml. |

No error in deficiency shall be permitted during verification.

17. Sealing and Stamping—

After adjustment for correct delivery, lead-and-wire seals shall be applied in such manner that no further adjustment can be made without mutilating the seal or seals. Plain wire shall not be used for lead-and-wire seal or seals. Inspector's stamp on the lead seal or seals shall be affixed by means of a plier. Inspector's stamp shall also be marked on the name-plate fixed on the dispensing pumps.

18. A name plate to be fixed on the petrol pump for identification shall be of the shape and design shown below:

* WEIGHTS & MEASURES (ENFORCEMENT) ACT, 1958

(NAME OF THE OWNER OF THE PUMP & PUMP NO.)

CAPACITY OF

PETROL

H.S.D.

D. PUMP

LITRE

**

*Name of the State. **Columns for Inspector's stamps.

19. Capacity—

The capacity of a dispensing pump of meter type shall be the maximum graduation on the dial or register.

The capacity of a dispensing pump of container type shall be the capacity of the container or where there is more than one container the aggregate capacity of the containers.

SCHEDULE VIII

Abbreviations of Denominations

1. Decimal Multiples and sub-multiples—

| Prefix | Value in terms of unit | | | Abbreviation |
|---------------|------------------------|--|--|--------------|
| Kilo | 1000 | | | k |
| hecto | 100 | | | h |
| deca | 10 | | | da |
| deci | 0.1 (10-1) | | | d |
| Centi | 0.01 (10-2) | | | c |
| Milli | 0.001 (10-3) | | | m |
| micro | 0.000,001 (10-6) | | | u |

| 2. <i>Weights</i> — | | | |
|---------------------|----|---------|--------------|
| Denomination | | Value | Abbreviation |
| Metric tone | .. | 1000 kg | mt |
| quintal | .. | 100 kg | q |
| kilogram | .. | 1 kg | kg |
| hectogram | .. | 100 g | hg |
| decagram | .. | 10 g | dag |
| gram | .. | 1 g | g |
| decigram | .. | 100 mg | dg |
| centigram | .. | 10 mg | cg |
| milligram | .. | 1 mg | mg |
| carat | .. | 200 mg | o |

| 3. <i>Capacity</i> — | | | |
|----------------------|----------|--------|--------------|
| Denomination | | Value | Abbreviation |
| Kilolitre | .. | 1000 l | kl |
| hectolitre | .. | 100 l | hl |
| decalitre | .. | 10 l | dal |
| litre | .. | 1 l | l |
| decilitre | .. | 100 ml | dl |
| centilitre | .. 10 ml | 10 ml | cl |
| millilitre | .. | 1 ml | ml |

| 4. <i>Volume</i> — | | | |
|--------------------|---|-------|----------------------------|
| Denomination | | Value | Abbreviation |
| Cubic metre | .. m ³ | | m ³ or cu m * |
| Cubic decimetre | .. 10 ⁻³ m ³ or 100 cm ³ | | dm ³ or cu dm * |
| Cubic centimetre | .. cm ³ | | mm ³ or cu mm * |

| 5. <i>Length</i> — | | | |
|--------------------|-------|----------------------------------|--------------|
| Denomination | | Value | Abbreviation |
| Kilometre | .. | 1000 m | km |
| hectometre | .. | 100 m | hm |
| decametre | .. | 10 m | dam |
| metre | | 1 m | m |
| decimetre | .. | 10 cm | dm |
| centimetre | .. | 1 cm | cm |
| millimetre | .. | 1 mm | mm |
| micro | | 1/1000 mm or 10 ⁻³ mm | μ |

| 6. <i>Area</i> — | | | |
|-------------------|----|--------------------------|----------------------------|
| Denomination | | Value | Abbreviation |
| Square kilometre | .. | 1,000,000 m ² | km ² or sq km * |
| square metre | .. | 100 m ² | m ² or sq m * |
| square centimetre | .. | cm ² | cm ² or sq cm * |
| square millimetre | .. | mm ² | mm ² or sq mm * |

| 7. <i>Land Measures</i> — | | | |
|---------------------------|-------|--------------------|--------------|
| Denomination | | Value | Abbreviation |
| are | | 100 m ² | a |
| hectare | | 100 a | ha |
| centiare | .. | m ² | ca |

*Both these abbreviations are current, but the first set should preferably be used.

NOTE—No change shall be made in the abbreviation to indicate plurality.

SCHEDULE X

Maximum Permissible Errors in Net Weight or Measure of Packed Commodities

| | Permissible error |
|---|---|
| (1) <i>Raw Cotton packed—</i> in standard bales of 180 kg | ± 5 kg |
| (2) <i>Cotton Yarn—</i> Full bale of 180 kg | ± 5 kg |
| $\frac{3}{4}$ bale of 135 kg | ± 3.75 kg |
| $\frac{1}{2}$ bale of 90 kg | ± 2.50 kg |
| $\frac{1}{4}$ bale of 45 kg | ± 1.25 kg |
| (3) <i>Cement—</i> at factory | ± 2 percent |
| in retail trade | ± 3 percent |
| (4) <i>Tea—</i> Retail packages of 500 g, 250 g & 100 g | ± 1 percent at the place of packing. |
| Chests packed at places other than tea gardens. | ± 1 percent at the place of packing. |

The net weight of packages or chest of tea shall be verified only at the place of packing.

| | |
|--|-----------------------------------|
| (5) <i>Jute cloth—</i> Length of Jute Cloth | ± 0.5 percent |
| (6) <i>Paint—</i> | Permissible error ± 1 per cent |

SCHEDULE XI

Procedure to be followed for Inspection, Verification and Stamping of Commercial Weights and Measures and Weighing and Measuring Instruments used or for use in Transactions.

PART I—WEIGHTS AND MEASURES

1. *Weights—*

(a) All weights before stamping shall be verified for correctness against the corresponding working standard weight in the appropriate working standard balance subject to the permissible errors specified.

(b) Weights shall be stamped on the lead in the loading hole at the bottom of the weight, provided that weights without an adjusting hole shall be stamped on the undersurface.

(c) No weights used in gold and silver trade shall be stamped unless they are bullion weights.

(d) No weights used in pearl and precious stone trade shall be marked unless they are carat weights.

2. *Liquid Measures of Capacity—*

(a) Liquid capacity measures shall be tested by filling the working standard measure with water and emptying the contents of the working standard into the measure under test.

(b) In testing a glass measure, the capacity of which is not defined by the brim, the level of the water shall be taken at the bottom of the meniscus.

(c) Where the capacity is indicated by a line, the measure shall be tested to the bottom of the line.

3. *Measures of Length—*

(a) Every measure of length shall be verified by comparison with the working standard.

(b) A link measure, or woven metallic or steel tape measure, shall be tested when subjected to a tension or pull as follows:—

Link Measures—8 kg.

woven Metallic Tape Measure—1 kg.

Steel Tape Measure.

(c) The measure under test shall be supported throughout its whole length on a plane and even base.

(d) Tape measures which are intended to be used in cases may be accepted for verification and stamping if submitted even without the case.

(e) All non-flexible measures of length shall be stamped on the rivets provided in the measure.

(f) In the case of the tape measure, the stamp shall be placed on the metal strip attached to beginning of the measure.

(g) In the case of link measures, the stamp shall be placed either on a metal label or rise permanently attached to the measure or on the brass handle.

4. *Volume Measures—*

(a) All measures of volume shall be examined with the object of discovering flaws or want of straightness and proper right angles at the corners.

(b) Every measure of volume shall be verified by comparing length of each side against the working standard of length at or near the normal temperature.

(c) The limits of errors in the case of lengths of the sides of measures of volume shall be the same as prescribed for linear measures.

(d) All measures of volume shall be stamped near the top edge or brass plate securely fastened to them.

PART II—WEIGHING AND MEASURING INSTRUMENTS

1. *General—*

Weighing and Measuring instruments shall be tested to conform to the specifications given in Schedule VI.

2. *Beam Scales—*

(a) On beam scales, the verification stamp shall be placed on the stud or plug on the beam, immediately under or over the central knife-edge.

(b) The Inspector may stamp the plug or stud in the same manner as he would stamp a weight.

3. *Counter Machines, Spring Balances, Steelyards and Automatic Machines—*

The verification stamp shall be placed upon the plug or stud provided in the instrument for that purpose.

4. *Platform Machines and Weighbridges—*

(a) Weighbridges, Platform Machines and such other weighing instruments and the Controller may specify in this behalf, shall be verified and stamped *in situ* in addition to any preliminary test in the manufacturer's or dealer's premises. Such a preliminary test shall be made at the request of the manufacturer or dealer.

(b) The verification stamp shall be placed upon the plug or stud provided for the purpose in the machine.

5. *Crane Machines—*

(a) Hydraulic Machine in which it is necessary in order to get a correct weight indication, to twist the load hook, shall not be stamped unless a prominent notice to this effect is permanently affixed to the machine.

(b) The verification stamp shall be placed upon the plug or stud provided for the purpose in the machine.

PART III—CALIBRATION OF VEHICLE TANKS FOR PETROLEUM PRODUCTS AND OTHER LIQUIDS

1. *Definitions—*

(a) *Vehicle Tank*—An assembly used for the delivery of liquids comprising a tank which may or may not be subdivided into compartments, mounted upon a vehicle together with its necessary piping, valves, meters, etc.

(b) *Compartment*—The entire tank, when this is not subdivided; otherwise, any one of these subdivisions of a tank designed to hold liquid.

(c) *Calibration*—Verification and stamping of the capacity of the vehicle tank.

(d) *Dip Stick*—A square or rectangular metal bar of brass or any other suitable hard material used to determine the depth of the liquid in the tank.

(e) *Ullage Stick*—A T-shaped metal bar of brass or other suitable material used to determine the depth of the level of liquid from the top of the dip pipe.

(f) *Ullage Indicator*—A device bolted to the inside of a manhole neck ring with the indicator set to any desired level to which liquid in the tank is required to be filled.

2. *Testing Medium—*

(a) *Compartment Testing*—Water or other appropriate liquid shall be used as a testing medium in determining the capacity of a vehicle tank compartment.

(b) *Meter Testing*—A vehicle tank meter shall be tested with a liquid of the same character or of approximately the same viscosity as the liquid to be commercially measured through the meter.

3. *Equipment and Tools—*

The following equipment and tools are required for calibration of vehicle tank.

(a) *Proving Measures*—When available, shall be checked for accuracy against an appropriate working standard measure.

(b) *Calibrated Bulk Meter*—An accurate meter fitted with a pre-set valve, air eliminator and strainer, which has been checked for accuracy against an appropriate working standard measure.

(c) A set of standard commercial measures.

(d) Other equipment and tools, *viz.*, hose pipes, scribe, punch, try square, tyre pressure gauge, hammer, etc.

4. Calibration Procedure—

(a) Vehicle tanks used as measures shall be calibrated as capacity measures. In the case of meter equipped tanks, the meter shall be treated as a separate measuring instrument for purpose of calibration.

(b) The compartment capacity or capacities shall be constructed as including the capacity of the piping leading from the emergency, safety or master valve (which is positioned at the lowest point of outlet from the compartment) to the outlet valve or screw cap.

(c) The proving measure or bulk meter should be mounted on an overhead gantry or a separate framework in a convenient position above a firm and level platform, preferably of concrete on which the vehicle stands during calibration.

(d) The vehicle shall be placed in a level position before commencing calibration as the accuracy of calibration depends on the level of the tank; the sequence in which compartments are calibrated should be such as to minimise unequal spring deflection on the axles of the vehicle.

(e) The front and rear tyres of the vehicle should be at the correct pressures. The tyres should be inspected for wear which should be reasonably even and there should not be excessive difference in wear in the tread between the front set of tyres and the rear set at the time of calibration.

(f) The interior of the compartment should be inspected and cleaned where necessary.

(g) Before starting calibration, the pipelines, outlet valves and other connections shall be tested against leakage by partially filling and draining each compartment in turn through the outlet valve. During the process sufficient quantity of the testing medium should be introduced inside the compartment to wet the internal surface of the tank and pipelines.

(h) Following the general precautions listed above, the vehicle compartment to be calibrated shall be filled with proving measures or a bulk meter up to the quantity, the compartment is designed to hold with piping leading to the outlet valve or screw cap full. The dip-ullage mark is taken carefully and the line is cut on the dip/ullage stick at right angles to the axis by means of the try square and scribe. If an ullage indicator is used, it is correctly set and sealed.

(i) A mark should also be made on the dip stick to indicate the "proof line" which is the level of the top surface of the dip pipe. In the case of ullage stick, the distance from the ullage point to T-joint should be marked on the stick.

(j) Each compartment should be left full before proceeding to the next in sequence.

5. Permissible Errors—

(a) Proving measures shall have the following capacities and shall be adjusted within the following permissible errors:—

| Capacity | Permissible Error |
|----------|-------------------|
| Litres | Millilitres |
| 50 | 50 |
| 100 | 100 |
| 200 | 200 |
| 500 | 500 |
| 1000 | 1000 |
| 1500 | 1500 |
| 2000 | 2000 |
| 5000 | 5000 |

(b) The maximum error for vehicle tank compartments shall be 0.6% percent in excess of the marked capacity of the compartments.

6. Markings—

(a) The vehicle shall have a brass plate revetted in a prominent position on it to receive the inspector's stamps. The brass plate shall bear the following particulars: title of Weights and Measures Act, name of owner of vehicle, vehicle registration number, and the serial number and capacity of each compartment. Space should be provided on the plate for the Inspector's stamps. Fig. 1 shows a simple design for a plate.

(b) The capacity of the compartment shall be indelibly marked on the machine cover of the compartment and also painted on each side of the compartment so that it is clearly visible. If there are more than one compartments, then each compartment shall have its capacity marked separately as above and the compartments numbered serially. The number of the compartment shall also be marked on the discharge valve pertaining to the compartment.

(c) The vehicle registration number as well as the capacity of the compartment shall be indelibly marked on the dip/ullage stick at the top end. If there is more than one compartment, the different faces of one dip stick may be used for markings and each face shall bear the vehicle number, the serial number of the compartment, the proof and dip lines of that compartment and the capacity of the compartment.

| THE (NAME OF STATE) WEIGHTS & MEASURES (ENFORCEMENT ACT, 1958 | | | | |
|---|----------------------------------|-----------------------------|--|--|
| NAME OF THE COMPANY _____ | | | | |
| VEHICLE TANK NO. _____ | | | | |
| Compartment Number | Compartment capacity (in litres) | Space for Inspector's stamp | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

FIG. 1—Name Plate.

SCHEDULE XII

Dry Measures

1. General—

This part deals with cylindrical measuring vessels for dry measures. These are mainly used for measuring out grains and granes paddy, wheat etc. and the capacity is the struck volume.

2. Denominations—

The following table gives the denominations of the cylindrical measures with details regarding the diameter and depth of vessels and thickness of material:—

| Serial No. | Denominations | Depth in c.ms. | Internal diameter in c.ms. | Thickness of material |
|------------|---------------|----------------|----------------------------|-----------------------|
| 1 | 2 | 3 | 4 | 5 |
| 1 | 10 litres | 30.00 | 20.65 | 16 S.W.G. |
| 2 | 5 litres | 25.00 | 15.97 | 16 S.W.G. |
| 3 | 2 litres | 17.50 | 12.00 | 18 S.W.G. |
| 4 | 1 litre | 15.00 | 9.20 | 18 S.W.G. |
| 5 | 500 ml. | 10.00 | 7.98 | 20 S.W.G. |
| 6 | 200 ml. | 7.50 | 5.83 | 20 S.W.G. |
| 7 | 100 ml. | 6.00 | 4.60 | 20 S.W.G. |

3. Shapes and Dimensions—

The columns (3) and (4) of the above table give the internal depth and diameter of the cylindrical measures (to be used for dry measure) corresponding to the respective denominations. The shape and dimension shall be as in the figures given below:—

1. Materials—

The body of the cylindrical measures shall be pressed from aluminium alloy sheets, brass sheets or stainless sheets. Mild steel can also be used. The minimum thickness of the sheets shall be as specified in column 5 or table under item 2. The aluminium alloy sheets and brass sheets may preferably conform to N.S. 3 of I.S. 737-1953 respectively.

5. Handles—

Only the 10 litre and 5 litre sizes required handles—two numbers on diametrically opposite sides. These may be of 6.35 mm size for both.

6. Stiffening —

There shall be two reinforcement bands one at top and one at bottom. In the case of 10 litre and 5 litre sizes, the bottoms also shall be suitably reinforced. The 10 litre size requires a stiffener across the upper rim of size 12.5 × 5 mm. The larger dimension being the vertical plane of a diameter.

1. Manufacture and Finish -

- (a) The handles shall be of robust construction and shall be securely fixed to the body by means of riveting, soldering or brazing.
- (b) The measures shall be free from any surface defects and indentation and shall be smoothly finished at the top.
- (c) The striking bar shall be 9.525 mm. round of suitable length. The materials shall be mild steel or stainless steel.
- (d) Lead plug or stud shall be provided for the marking of inspecting authority.
- (e) The finished measures shall have adequate robustness for durability.

3. Marking—

- (a) Each measure shall have the denominations and maker's name or trade mark indelibly embossed or stamped indicating denominations on the measures and shall be twice the size of the letters indicating manufacturer's name or trade marks.
- (b) The denomination shall consist of Indo-Arabic numerals and the abbreviation 'ल' and 'लि' to indicate litre and 'मि लि' and 'मि लि' to indicate millilitre.

4. Permissible Error—

| Serial No. | Denomination | Verification errors in excess only | Inspection errors in excess only | Errors deficiency |
|------------|--------------|------------------------------------|----------------------------------|-------------------|
| | | Milli-litres | Milli-litres | Milli-litres |
| 1 | 10 l | 100 | 100 | 50 |
| 2 | 5 l | 50 | 50 | 25 |
| 3 | 2 l | 30 | 30 | 15 |
| 4 | 1 l | 20 | 20 | 10 |
| 5 | 500 ml | 15 | 15 | 7.5 |
| 6 | 200 ml | 8 | 8 | 4 |
| 7 | 100 ml | 5 | 5 | 2.5 |

SCHEDULE XIII

Licensing Forms

Form 'A'

OFFICE OF THE CONTROLLER OF WEIGHTS & MEASURES,

.....

Licence to manufacture/repair weights, measures, weighing instruments or measuring instruments

Licence No. Year.....

(1) The Controller of Weights and Measures

hereby grants to }
Name and address }
party or parties }

a licence to manufacture/repair the following:—

(Include details of the types of weights, measures weighing instruments or measuring instruments that are licensed to be manufactured/repared by the party)

(2) The licence is valid for the party named above in respect of his workshop located at

(3) This licence is valid from to

(4) The manufacturer/repaurer shall comply with the conditions noted below. If he fails to comply with any one of these, his licence is liable to be cancelled.

(5) The trade mark/monogram being used by the manufacturer is as under:

Signatures

Controller of Weights and Measures

Date

Place.....

(Seal)

Note—In the case of firm, its name with the names of all its members should be given in paragraph 1.

Conditions of Licence

1. The person in whose favour this licence is issued shall:

- (a) comply with all the relevant provisions of the Act and Rules for the time being in force;
- (b) not encourage or countenance any infringement of the provisions of the Act, or the Rules for the time being in force and shall report without delay to the Inspector and infringement that may come to his notice;
- (c) keep this licence exhibited in some conspicuous part of the premises to which it relates;
- (d) comply with any general or special directions that may be given by the Controller Weights and Measures of
- (e) surrender the licence if and when required to do so by the Controller or any other officer employed under the Act.

2. Every condition prescribed after the issue of this licence shall, if notified in the official gazette, be binding on the person/persons to whom the licence has been granted.

Form 'B'

OFFICE OF THE CONTROLLER OF WEIGHTS & MEASURES

Licence to a dealer in weights, measures, weighing instruments or measuring instruments

Licence No. Year

(1) The Controller of Weights and Measures

hereby grants to }
(Name and address }
of party or parties }

a licence to deal in the following:—

(Indicate details of the types of weights, measures, weighing measuring or instrument that are licensed to be dealt with by the party).

(2) The licence is valid for the party named above in respect of his premises located at

SCHEDULE XIV
[Sec rule 26(2)]

Licensing and renewal fees for manufacturers, repairers or dealers of weights, measures, weighing or measuring instruments

| | |
|-----------------------|--------------------|
| Manufacturers | Rs. 25.00 per year |
| Repairers | Rs. 5.00 per year |
| Dealers | Rs. 10.00 per year |

(3) This licence is valid from.....to.....
(4) The dealer shall comply with the conditions, noted below. If he fails to comply with any one of these, his licence is liable to be cancelled.

SCHEDULE XV
[Sec Rule 26(1)]

Register of licensed manufacturers/repairers/dealers in weights/ measures/weighing instruments/measuring instruments

OFFICE OF THE CONTROLLER OF WEIGHTS AND MEASURES

Signature
Controller of Weights and Measures
Date
Place.....

(Seal)

Note—In the case of firm, its name with the names of all its members should be given in paragraph 1.

Conditions of Licence

1. The person in whose favour this licence is issued shall:
- (a) comply with all the relevant provisions of the Act and Rules for the time being in force;
 - (b) not encourage or countenance any infringement of the provisions of the Act, or the Rules for the time being in force and shall report without delay to the Inspector and infringement that may come to his notice;
 - (c) keep this licence exhibited in some conspicuous part of the premises to which it relates;
 - (d) comply with any general or special directions that may be given by the Controller of Weights and Measures of.....;
 - (e) surrender the licence if and when required to do so by the Controller or any other officer employed under the Act.

2. Every condition prescribed after the issue of this licence shall, if notified in the official gazette, be binding on the person/persons to whom the licence has been granted.

| Licence No. | Date of issue | Name, parentage & residential address of the manufacturer/repairer/dealer. | Place where workshop is situated. | Articles to be manufactured/ repaired/sold | Trade Mark monogram being used. | Orders regarding cancellation of licence. | Result of appeal | Remarks |
|-------------|---------------|--|-----------------------------------|--|---------------------------------|---|------------------|---------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Note 1— In the case of a firm, its name with the name of all its members shall be given in column 3.
2—Column (6) does not apply to repairers and dealers.

M. RAMUNNY
Administrator